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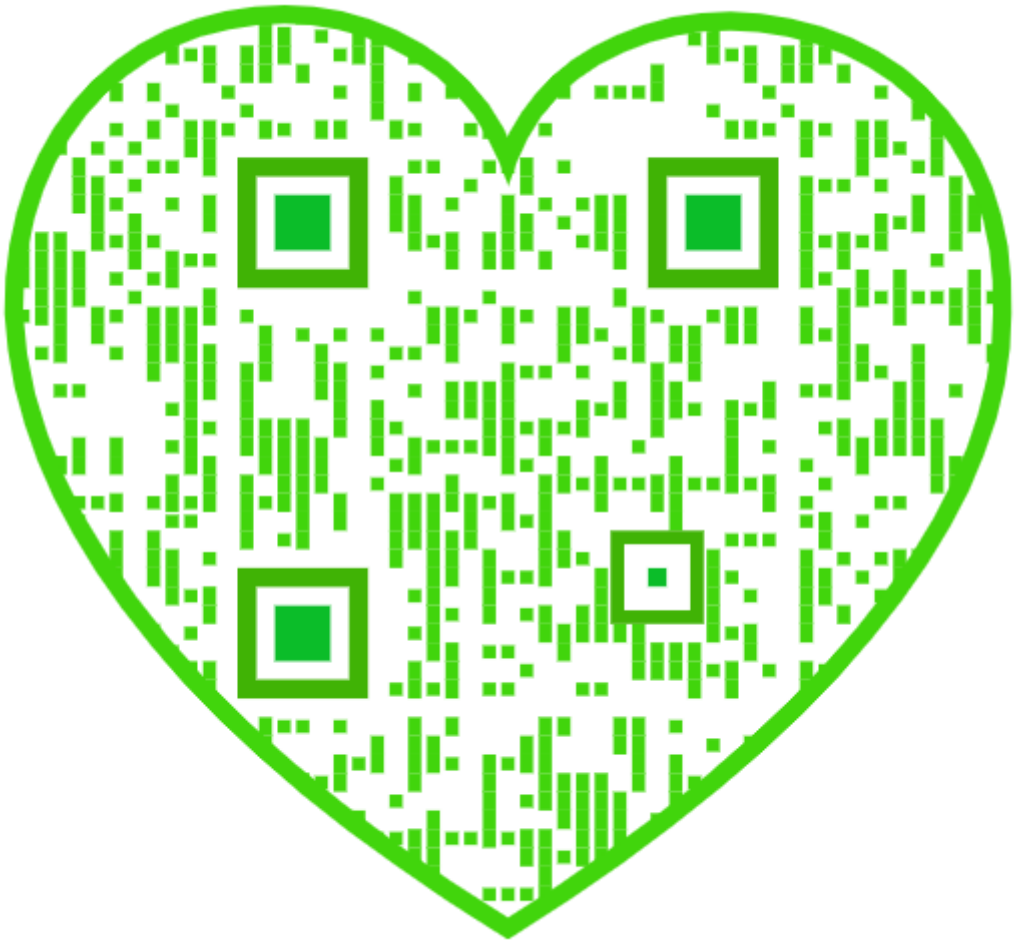

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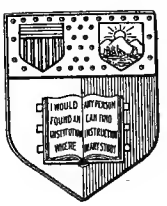

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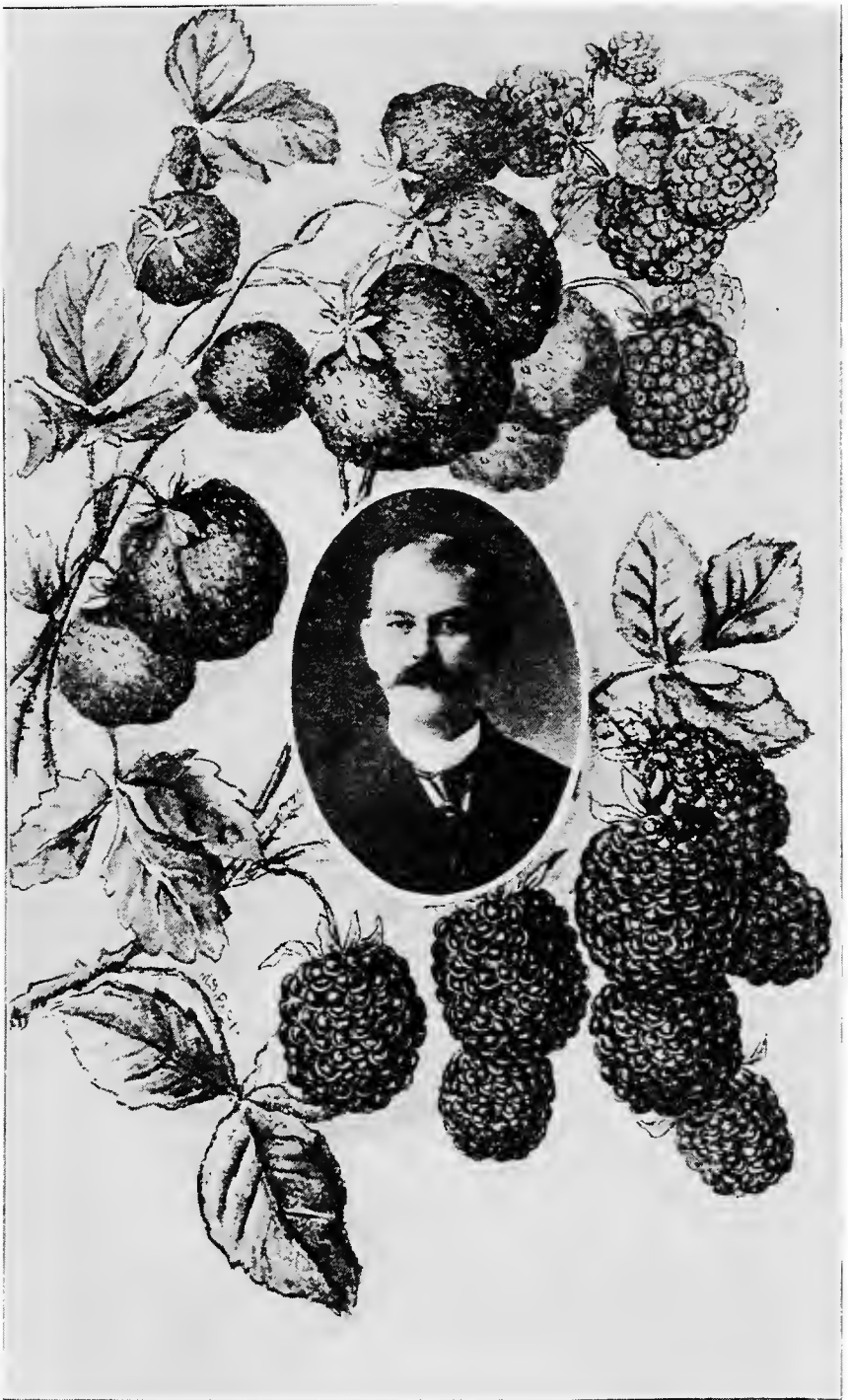
FARMER ON THE STRAWBERRY

The New Strawberry Culture

AND

Fall Bearing Strawberries



FARMER ON THE STRAWBERRY

The New Strawberry Culture

AND

Fall Bearing Strawberries

By LAWRENCE JONES FARMER

"The Strawberry Man"

PULASKI, NEW YORK

THE DEMOCRAT PRESS

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PREFACE

I have been engaged in the culture of strawberries and other berry fruits since 1883, beginning when I was a boy of 17 years. A person of ordinary intelligence who has been engaged in any business for this length of time cannot help but find out many things that are valuable to himself in his business and may be made valuable to others if he has the ability to impart his knowledge. That is the particular reason for my writing this little book on strawberry culture. I do not pretend that I know it all, or that this little pamphlet will cover all there is to be said about the culture of strawberries and other small fruits, but I have applied myself closely to the study of this subject during all these many years and must have found out many things that are not known to the average person.

I would not be doing my duty if I did not try to impart this knowledge to others in some way or other. There is nothing written in this little book that cannot be found out by years of experience, but experience is costly and the most of us rather learn to avoid mistakes rather than to suffer the expense of these mistakes to gain the costly experience that they teach.

When I begun strawberry culture, there were few popular books on the subject and while I learned much by reading the writings of such men as E. P. Roe, A. M. Purdy, Matthew Crawford and others, the most of my knowledge has been gained by experience, and I can tell you, much of it has been pretty costly; but however it has been, I do not regret the experience, no matter the cost. There is a certain class of people for whom I have little charity and they deserve the contempt of every progressive horticulturist. I refer to the class that have the advantage of perfecting themselves, becoming experts in any subject, and yet, never impart their knowledge to others. They attend meetings of farmers, horticultural society meetings, &c &c; and when called upon to tell something of what they know about their speciality, they have nothing to say. They absorb everything they hear, but like a sponge, they take up more than they give out, even if squeezed. I am amused as well as somewhat disgusted to hear now and then of some man who has learned something about growing berries that he considers he is the sole possessor of.

He goes about in his self conscious way and chuckles to himself that he knows something that he wont tell to others Generally I have a way of getting this out of him and when I find out the so called secret, it is usually something that most progressive fruit growers have known for years and partially forgotten. My idea is that the world is wide and nobody makes much by practicing selfishness. When I learn of a really good new thing, I pass it along to others, and by the time they have learned and put it into practice, I have generally found out something still more valuable along the same line.

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LAWRENCE J. FARMER,
Pulaski, N. Y.

January 1912.

A Well Balanced Strawberry Plant

Really the most important item in strawberry culture is the plant itself. You must start with good plants in order to make a success. If the plants are puny, weak and of no vitality, your efforts will be largely wasted. Likewise, will the results be disappointing if the plant is of a comparatively worthless variety. Be sure to get good healthy plants of the right variety. The illustration is a typical well fed strawberry plant. It must have been grown on good soil with plenty of room Such a plant ought to produce a quart of berries during the fruiting season. Its runners should be strong and produce new plants of the same superior quality.

That fleshy part of the strawberry plant where the roots and leaf stems unite, is known as the crown of the plant. It is the real life of the plant. You can cut off the roots close up to the crown and the plant will grow a new set of roots, if it is kept moist. You can cut off every leaf from the strawberry plant, close down to the crown, and a new set of leaves will come out. But, if you remove the crown of a strawberry plant and destroy it, you cannot grow a new crown from either the roots or the leaves. The crown is the real vital part of the strawberry plant.

THE STRAWBERRY

A Most Interesting Fruit

Of all the so-called small fruits or bush fruits, the strawberry is the most interesting and the most popular. They come at a time of the year when fruits are scarce and supply a long felt want, they are so luscious and palatable that few are the people who do not eat and enjoy them. The strawberry plant thrives and bears fruit from the frozen North to the sunny South, in all localities and on all soils that most any crop will grow upon. They live and bear in unfavorable places and under neglect but on the other hand do better in ideal locations and respond nobly to intelligent, thoughtful care.

Origin of the Strawberry

The origin of the name given to this fruit is not clear, some authorities claiming that it comes from one source and some from another. Some reasons given for the name are "straw" a perversion of the name "stray" berries because of their universal distribution throughout the fields. Then "straw" from the straw-like character of the runners. Then "straw" from the habit of growers covering the vines and the ground about them with straw as a winter mulch and also as a mulch to keep the vines moist and the berries clean throughout the picking season.

The strawberry has covered the plains and valleys of all continents since man has been an inhabitant of this globe, undoubtedly. Ancient history, and the writings of Greek and Roman authors speak of them. They figure in poetry and prose of most all ancient writers and undoubtedly grew by the waysides in Palestine when the "Prince of Peace" trod those sacred pathways.

The origin of the modern cultivated strawberry is somewhat of a mystery. Some authors claim that it has been evolved from the common wild berries by a system of sowing seeds and giving good culture from generation to generation until the large ,fine flavored, productive variety was finally secured. Prof. L. H. Bailey gives it as his opinion that the most of our cultivated varieties of strawberries all come from the Chilian species of strawberries, rather than from our native Virginian or Iowan species. I am of the opinion that the garden or cultivated strawberry is a combination of the Chilian and Virginian species, improved by high culture and by crossing and recrossing the blossoms and sowing the seeds. The scrub native cow can be improved and bred up in two ways,—by crossing her with a thoroughbred, the progeny is improved. In the same way, she and her progeny are improved from generation to generation with high feeding and good care. It is the same with the strawberry.

The Different Species of Strawberries

The Chilian strawberry grows on the west slope of the Rocky and Andes mountains of North and South America and is distinguished by its large size naturally, its prominent seeds which protrude and cover the outside or surface of the berry and especially for its ability to respond to improved conditions. It has more character to its flavor than any other species of the strawberry.

The Alpine or Wood strawberry is a native of Europe and the British Isles. It has a tendency to continual bearing during the growing season and is sometimes called a monthly everbearing strawberry. It is small and does not respond to improved conditions like the Chilian or Virginian strawberry. When I was a boy, we used to find them in the woods and in shady places. They are long and pointed with an entirely different flavor from other species. The seeds are prominent on the surface and are set closer together than on other species of strawberries. We boys used to call them "sheep teats."

The Virginian strawberry is the species that grows wild in the fields of North America. It is deep red in color, the seeds are embedded deeply in the flesh, hence they are less firm than Chilian or Alpine strawberries. They have a fine flavor to most people and a rich aroma which is very pronounced when they are allowed to stand for a time in a closed room. They have a lack of character to their flavor which however is not noticed by inexperienced tastes, but is very noticeable to those who have been used to choice, well cultivated garden strawberries of such varieties as Jessie, Marshall or Brunette. Those who long for the sweet wild strawberries of their childhood days, forget that

most anything tasted good when they were children, even green apples. I dislike to destroy idols, but the idea that many people have that well cultivated garden strawberries of the best flavored varieties are inferior to wild ones is preposterous. The wild strawberries of Iowa and the West are larger than the Virginian species and some of the improved varieties, such as Earliest, August Luther and Michel's Early are quite popular for market varieties. The wild Virginian or Iowan strawberry responds to improved conditions and those who prefer the flavor of the wild to the cultivated strawberries can readily procure a few plants and grow them in their own gardens. They grow larger and produce more from year to year under cultivation.

The Unselfish Devotion of the Fruit Enthusiast

is almost beyond comprehension and very little appreciated by the average public. We eat the large, luscious strawberries and other fruits and care little for the men who have spent years of their life in hybridizing, sowing the seeds and experimenting to produce better varieties that the people can have them to enjoy. We owe much to these men that we can never repay. The story goes that the first Chilian strawberries were taken to France by M. Frezier in 1716. During the voyage, the supply of water nearly gave out and M. Frezier was compelled to divide his allowance of water with the 7 strawberry plants. According to Prof. L. H. Bailey, these 7 plants are the parents of most of all the varieties of garden or cultivated strawberries now under cultivation. When we think of the unselfish devotion of this Frenchman, in dividing his water to save these plants and what has come from it, we cannot but think that many people who go without them, could at least make the effort to set out a few plants of our improved varieties that their families and themselves might enjoy the most luscious fruit that the earth produces.

Who Ought to Grow Strawberries

Strawberrries to most people in the country are like heaven, objects of universal desire but of very general neglect. This is due to the fact that we do most everything about as our fathers used to do it and strawberries were not a common thing in the gardens of our fathers and hence they are not common with farmers today. It is true that there are quite a good many farmers who have the family strawberry bed, but it is also too true that the majority of them have not. Most farmers in order to be induced to set out the strawberry bed must "be born again" as it were. The influence of the wife who is constantly reminding him of it, has little avail unless he sees it himself by eating the fruit at a friend's or reading an article on the subject by some strawberry enthusiast like myself. The incentive must come from within himself. The common idea is that strawberries require painstaking care and extra skill. The fact is that they may be grown as readily and almost as easily as corn or potatoes and certainly as easily as common garden vegetables. Every farmer should have a strawberry bed and grow enough for the family to eat fresh and to put up for the winter. I don't recommend everybody to go into the business of raising berries for market, but I do recommend that they grow enough for family use. Then if they like the business and the environments are right, I recommend it as a profitable business, which if followed right will bring in better returns for the time and labor invested than most any other crop that can be grown. I recommend strawberry culture as a pleasant and profitable vocation for the professional and business man to while away his spare hours and get him out in the open and near to nature's heart.

The Profits of Strawberries

Strawberries are exceedingly profitable from a money standpoint, but this is not by any means all we get out of them. The doctor, lawyer or minister who has his little strawberry bed does not measure the value of the fruit he gets by what it would cost him if bought in the markets. The association of the plants, caring for them, seeing them grow, blossom and finally bring forth fruit is worth more to him than anything money can buy. It is a good deal so with the farmer. There is something about strawberries different from ordinary farm crops and people are made more refined by caring for them. There is an aesthetic element developed in the farmer who grows strawberries that is not brought out by growing ordinary farm crops. Hence we say that the strawberry farmer is superior to his neighbor who farms ordinary crops, generally speaking. The yields of strawberries are somtimes simply enormous. It used to take quite an effort to convince people that they would produce as many quarts to the acre as either corn or potatoes, but now strawberry growers don't strop at this. We hear of 25,000 and even nearly 50,000 quarts to the acre being grown with special care and improved methods. It is nothing uncommon to hear of farmers getting $1,000.00 per acre from strawberries when given good culture. In Oswego County where I live,

the farmers who follow strawberry culture are better off financially than their neighbors, some of them paying off large mortgages in a year or so with the receipts from their strawberry crop. It is hard to get at the average yield of strawberries to the acre and as hard to get at the average price received. During the past few years, the man who does not average 5,000 quarts to the acre is behind the light house and I think the average price has been about 10c per quart.

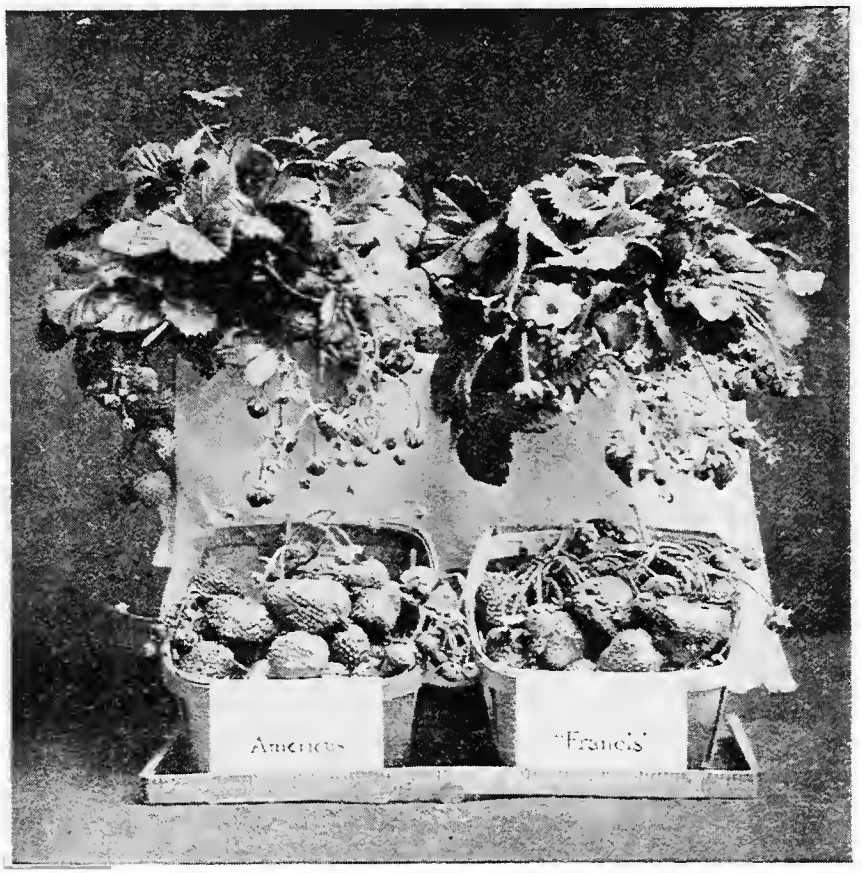


Exhibit of Francis and Americus Fall Bearing Strawberries, photographed Oct. 23, 1910.

Strawberry Culture as a Side Issue

Strawberries and poultry keeping go well together, the poultryman generally has more time than he needs to devote to his poultry and this cannot be taken up any more profitably in anything than strawberry culture. The poultry needs attention, morning, noon and night and the strawberries between. The manure from the poultry also works in nicely in growing a fine crop of plants and large berries, if well balanced up with mineral elements of fertility which may be bought. There is hardly anything that will turn poultry manure into dollars like strawberries.

Dairying and strawberries go well together. It is almost impossible for the dairyman to produce enough from his cows to live as farmers ought to live in this day and age, without some side issue crop, that he can turn into money to piece in. Strawberries make a good crop for this purpose. The manure from the dairy can be used on them freely and they will respond with the largest crops of the finest berries, if like hen manure it is supplemented with dissolved Bone or S. C. Rock and Sulphate or Muriate of Potash. Strawberries ripen at about the right time for the farmer, just after corn is planted and the first cultivatings have

been done and before haying, the most opportune time of the year, so far as rush of other work is concerned for the average dairy farmer. Compared with dairying the profits of an acre of strawberries are just about the same as from 10 cows. If the cows are well taken care of and are of a good breed, the results will be large compared with scrubs and poor care. It is the same with strawberries, if the varieties set are all right and they have good care, plenty of manure used and the highest cultivation given, they will respond in proportion. I often compare the strawberry bed to a bank. If you put plenty of manure and work into it, you can draw out large dividends, whereas if it is poorly cared for and neglected, the dividends will be small. When winter comes and the strawberry bed has been nicely covered with straw for a mulch to protect them, you don't have to even think of them until the first warm days of spring when they must be uncovered. Thus you have plenty of time for other things during the winter season.

Location of the Strawberry Bed

When everything has been settled, we have decided to set out the strawberry plants and the order for them has been sent to the nurseryman, the next real thing to think of is where to put out the plants when they come. In my lectures at Farmers' Institutes, I always tell the farmers to locate the strawberry bed as near the road and buildings as possible; that it can be got at readily when odd hours or half hours come when other things are finished, that would be usually wasted in lounging about the house or barns. If set near the road, it becomes an object of pride to the owner, who will see to it that it has the proper attention so that it will look nice to neighbors and others who may pass along the highway. If it is neglected and grown up to weeds, it becomes an eyesore to the owner, being where he can see it every day. Never locate it at the farther end of the farm. This is a poor place to locate any hoed crop; it is sure to be neglected. I do not like the old family garden plot for strawberry growing. It is true that the soil is rich and the vines will grow well, but it may be too rich in nitrogen and still worse, such places having been cultivated for many years, are full of fungus growths and unless spraying is resorted to very thoroughly, the plants will blight and mildew and produce very few berries. I like a field that has been cultivated in corn or potatoes for one or two years, just previous to setting out the plants. Another good reason for setting near the buildings, is that they generally are located on the highest part of the farm and the strawberry bed must be well elevated or else there is great danger of the blossoms being destroyed in early spring by frosts. If the strawberry bed is well elevated, the cold settles down in the valleys, there is a sort of current set in motion by this operation and the blooms are saved. Then, too, if near the road, prowlers and thieves are readily noticed. It must be located where you can see it.

Kinds of Soils

Most any good soil will grow strawberries to some extent. Like other crops, however, they have their preferences. As a rule, the soil should be porous and well drained. There are only a few varieties that will do well on wet soggy land. Light sand and gravel are best for first early berries. Heavy clay is hard to handle and all varieties do not do well when grown upon it. If well drained, however, it will produce the largest crops of the largest berries. Stony loam will produce large crops of berries, and it is undoubtedly the most reliable land you can get for berries, although it is hard to work and you will earn what you get. The stones draw the sun and help to retain moisture and carry a crop of berries through a dry spell when all other kinds of soils fail. The best strawberry lands in my own county are on stony loam, so stony that there is hardly room for them; and the farmers dig ditches, filling them in with stones, as well as building great stone walls between fields, to get rid of the stones. Such land hardly ever fails to produce a good crop of berries. Muck lands when water can be kept off the surface make as good soil for some varieties of strawberries. They are especially adapted for large varieties of not too vigorous growth. The ideal strawberry soil is a well drained clay loam, you might say, a combination of all kinds of soils.

Preparation of the Soil

If the soil is wet, that is, if it is too wet in spring or fall when the plants are to be set, it must be drained in some way to remove the surplus water. On low depressed pieces, we recommend deep open ditches, being sure they have a good outlet. If the piece is well elevated, we recommend that blind ditches be put in from 30 to 40 feet apart, all over the piece, using either tile or stone and seeing to it that the slope is good and that they have a good outlet that will not become clogged. In our own practice, we have constructed large main ditches through our fields, aiming to drain the sink holes and worst places with the large ditch and then have smaller feeders run from small sink holes and depressions into this main ditch. In

this way we drain our land quite effectually and economically.

Except on sandy soils that drift and blow about with the winds of winter, we prefer to plow in the fall. There are several advantages to fall plowing. One of the most important is that the work is sure to be done in season for setting the plants early. This is very important, especially if the weather is bad in the spring. You can generally get time to set the plants early if the soil is ready, even though it rains nearly every day but there are some seasons so wet that it is impossible to get time to properly plow, harrow and get in a large patch of strawberries beds with deep ditches. In refining the soil after the plow, any good harrow that will thoroughly pulverize the lumps and leave the surface level will do. There are several makes and each has its advantages. Early in the season, it is a good plan to set the harrow to dig quite deep, letting it dig nearly if not quite as deep as the plow run. Afterwards, I would run it shallower, especially just before the plants are set. We think it a good plan to harrow over land twice a week after it is plowed, up to the time the plants are set. If the land is thoroughly prepared, the plants need not be set so early as other-wise they would need to be were it

Plants of Rockhill's No. 6 and 9, Sept. 10. 1911.

on soil naturally moist and sticky. Plowing in the fall exposes the hard lumps and clumps to the action of the frost and changes the entire mechanical nature of the soil. It will harrow down mellow and dry without baking when plowed in the fall. Fall plowing, if done late, will throw to the surface quack roots and roots of other plants hard to kill, where, if the surface is uncovered most of the winter, they will freeze to death. In the same manner white grubs and other troublesome insects are killed by being plowed up just before winter sets in and exposed to the elements. It is sometimes possible to set strawberries on such sticky soil that they could not be set upon it in the spring, if the land is plowed in the fall and thrown up in narrow beds, or wide insufficiently prepared. It must be remembered that soil will dry out just as deep as it is stirred. If we wish to keep the moisture near the surface, which is very imperative when transplanting such shallow rooted plants as strawberries, we must stir very slightly the surface just before setting out the plants. One inch is plenty deep enough. The dust mulch made by stirring the surface slightly, acts as a preventive to the moisture that would otherwise escape into the air, and goes to the benefit of the plants. Soil is always moist that is below the stirred portion. We notice this in a very dry time in summer. If you go out in the road and kick off the dust, you will always find moist dirt below it, right up even with the dust mulch. You may have to dig several feet at the

side of the road where there is no travel in order to find as moist dirt as you find just below the dust in the middle of the road. Frequent stirring of the soil, whether by harrow, or by wheels of vehicles, tends to conserve moisture, which is stored just below the stirred surface. This is why plants that are cultivated, always look fresh and keep growing, while those left uncultivated, wither and sometimes succumb to the elements.

Plants and How to Procure Them

The best kind of strawberry plants are those grown from parent plants that were young plants when they were set out, the season before. These plants, if well grown, fertilized and sprayed, are the best kind of plants to be procured. We sometimes use young runner plants that grew from plants that have just fruited; and at times when we have no other plants of the variety wanted, we use the old black rooted plants. The young runner plants from old beds are smaller and not so vigorous as new bed plants and therefore will not produce as fine a stand of plants. The old black rooted plants are generally low in vitality and while they will withstand more grief, perhaps, than any other kind of plants, they are not to be recommended for best results. It mostly depends, however, on the vitality of the plants when they are set out. I would rather have old bed plants that were kept sprayed, fertilized, and growing, than new bed plants that were eaten up with mildew and blight and therefore low in vitality. Year in and year out, the only safe way is to spray your plants and then they will be sure to be full of vigor and vitality. There are numerous theories in regard to the value of large and small plants and what will be the results if either are planted exclusively. Some think that if you set only the largest, bushiest plants, the fruit will be produced in greater abundance and there will be fewer runners. These people also argue that if the last formed runners, or rather, the young plants formed last, are used exclusively, the result will be an extra large production of plants to the exclusion of fruit. I have sometimes thought the above to be true myself. One man tells me that if you select the second plant that forms on each runner, your crop of fruit will be the largest possible. I am inclined to think that the safest plan is to set the plants just as they come, the largest and the smallest, then if there is anything in the above theories, you won't run too much any one way. You will keep up the average from year to year and your variety will not run out in fruit or in runner production. I think that care after the plants are set has more to do in getting a large fine crop of berries than anything else. A lot of cull plants and good treatment will produce better results than the best of plants with slipshod care. There is absolutely nothing in the so called "Pedigree System" of producing strawberry plants except that it sounds nice and fools the public. Strawberry plants reproduce themselves through runners and seeds. The seeds are the only medium by which the strawberry can be permanently improved. This is true in plants as well as in animals. The male is crossed with the female and a new individual is produced whether it be plant or animal. The seed has to do it. In strawberry plants, the runners, or rather the plants produced by the runners, are only a reproduction of the same individual, just the same as if a multiplier onion was planted, the several young onions produced would be just like the parent onion, so far as variety was concerned. It is preposterous to argue that you can permanently improve the strawberry through the runners. By careful culture, increased fertilizing and spraying you can change a variety so that it appears to be improved permanently, but let these same plants be neglected, and they will go back to the old ways and produce no more than they did before the improved methods were practised. It is ludicrous to suppose that any man has wisdom enough to take a spy glass and go through a field of strawberry plants and detect which are better, so far as their fruiting capacities are concerned, than others in the same field. These schemes for making people believe one concern has a better stock of plants than others in the same business, have by ambitious strawberry plant growers been hatched out at intervals ever since I began strawberry growing 25 years ago. To illustrate how it works, I will give my own experience. Several years ago I had two parties growing the Plum Farmer raspberry plants for me on contract. For some reason or other, principally I think because one party used more animal fertilizer than the other, the fruit seemed to be larger and finer. It was very noticeable and the party who had the poorest berries was the first to bring my attention to it. We could explain it in no other way than that this party had developed a new strain. We advertised these plants as the "Dimon" strain of Plum Farmer. However, when planted side by side with the other strain, there was no difference in the fruit. Now if people get better results from so-called "Pedigree Plants" it is because perhaps these plants are well grown and second, they receive better care than usual after they are planted.

Procuring Plants

There is only one way to get a stock of plants in a new variety and that is to send to the nurseryman who has the plants and get them of him. After you get the first stock, you can grow the plants yourself if you prefer. In growing plants, better results can be obtained if you set your propagating plants by themselves and not try to grow plants and fruit on the same ground. If you dig plants from the fruiting rows, it must be done quite early or they are much injured by the operation. The better way is to allow the fruiting rows to make just the proper number of plants for best results in fruiting. The plants that are set for growing a new stock of plants for transplanting, should be set in a very rich spot and kept healthy by frequent sprayings with Bordeaux Mixture. It is getting quite common among growers who produce the finest berries, to buy their entire stock of plants. The improved methods of handling plants now understood by most nurserymen, enable them to lay down at the customers door strawberry plants nearly, if not quite as fresh, as if dug from one's own patch. It is always best to send in one's order as early as possible and let the plants come as soon as the nurseryman wishes to send them. Never set an exact date when they must be shipped if possible but state about when they may be sent. It should be remembered that the nursery business is an exacting business and the work of a whole year must be rushed into a few short months of the early spring when the weather is often unfavorable. Generally most everybody wants their plants at the same time. If your plants come earlier than you are ready to plant them, just heal them in closely together and keep watered and sprayed as we will show you how to do in another chapter of this book. No one can exactly tell when is the proper time to have plants come, it mostly depends upon the weather at the time they are set, whether plants do well or not. We have often had plants do better when set in June than when set in April, because the weather conditions were more favorable. It is safest to have the plants come as early as possible, then they can be healed in and set out at an opportune time.

Plants of Teddy Roosevelt, Superb and Rockhill's No. 7, photographed Sept. 10, 1911.

Taking up Plants and Fixing Them Ready to Set

The best time to take up strawberry plants is in the fall after growth is stopped or in early spring before new growth starts. It is not always possible however to get them all taken up at this

time and they may be taken up at different stages of their growth with varying results. The nearer the dormant state they are, the better they will do when transplanted, provided conditions of weather are the same. If plants are taken up and handled in July or August they must be very carefully kept from the sun and winds or vitality is soon destroyed, but if taken up in March or April, they will endure quite a little exposure to sun, winds and unfavorable weather. I have dropped plants, in April, on the surface of the soil, and had them start root with no covering of earth. Thus it will be seen that they can be more carelessly set early in the spring than later on. In taking up plants, some tool must be used that will get all or nearly all of the roots of the plants out of the ground without mangling or breaking them more than is absolutely necessary. The more roots on a strawberry plant, other things being equal, the better. I see nothing gained by tearing off part of the roots. For taking up plants, there is nothing better on heavy or stony soils, than spading forks. On sand and light gravel, the five or six tined manure fork is all right. These tools will get all or nearly all the roots that are needed to be got. Many people use the potato hook but this tears and mangles too many of the roots to suit us, unless the soil is very easily handled and the plants have rooted quite shallow. The tool should be put down deeply so that when the plants are lifted out, the earth and all will come with them, thus avoiding much breaking of the roots. One should be careful to not walk on the plants or jab the crowns and destroy them when digging the plants. For this reason, we prefer that men dig towards the plants, throwing the forkfulls behind them, rather than to back towards the row of plants they are digging. When the plants are dug, they should be immediately shaken from the earth and tied into bunches in the field, or gathered into receptacles and carried into a cool and shady shed, free from sun and winds, where they may be counted and bunched. If they are bunched in the field, each bunch must be buried in the moist, cool soil as they are tied up, or placed in wet sacks. Whether the plants are carried to the packing shed or bunched in the field, they must be kept from wind and sun, and therefore practically air tight baskets or sacks are better for this use than loose open ones. It largely depends upon the season of the year, however, and the condition of the atmosphere. If sacks are used, two are better than one. Our practice is to put one sack inside the other one and wet the inside sack or both of them. The two sacks being placed together, make a dead air chamber between them, and prevents air passing readily through them. Wetting the sacks not only keeps the plants moist but it cools them, especially when the sun is hot and the evaporation is going on rapidly. It is well known that evaporation is a cooling process.

Whether the plants are taken up to set right out or to ship away, they should be treated about the same. In handling the plants we use the right hand to shake out the earth and straighten the roots and the left to hold the bunch. We count out 26 plants to each bunch and then take the shears and trim off all the old dead runners and leaves and part of the new leaves if they are in the way, leaving the tops about one inch long above the crowns of the plants. If the plants are to be set out at once or trenched in temporarily, we trim the roots to the required length, say four inches. Trimming the roots does not benefit them. We prefer that they be set full length if possible; but in practice, we find that it is almost impossible to set plants satisfactorily if the roots are left full length. It is better to have a plant set right with roots trimmed to three inches than to have the roots all crowded into a shallow hole and none of them set straight down. Theoretically speaking, it is best to have the roots spread out fan shape, but in actual practice this is almost impossible and we get the finest results if roots are put down straight as deeply as possible. The deeper they are set, the less they will suffer from droughts. If one has but a few expensive plants to set, he can dig a large round hole, making a mound in its center and place the plant on this mound, spreading the roots all over the mound; and then fill in around the plant with earth. The very best results can be attained in this manner. Many people go to the expense of trimming each plant separately. This is all well enough, but practically the same results can be attained by holding a bunch of twenty-six plants in the left hand, with roots and crowns on an even and running the shears rapidly over the tops removing all surplus leaves and runners on 26 plants as easily and expeditiously as one would trim a single plant by the old process. If plants are set out at once, they should be placed in shallow pans with water in the bottom and taken to the field and there protected from sun and winds until planted out. We utilize shade trees and boxes for this protection. Instead of shallow pans, we sometimes use market baskets for holding plants that go to the field, lining them with oiled paper so they will hold water and stand the plants upright, roots down in the baskets filling them full so that they hold from 250 to 500 plants each. If the strawberry patch

is not quite prepared, we can store the plants in sheltered cool places, like the family cellar or woodshed for a few days, the roots protected with wet moss or sawdust to keep the air away from them. They may even be set in pans with a little water in the bottom, but should not be kept too long standing in water. There are people who claim that they prefer to have plants taken up and held for a few days before setting, rather than to have them taken up and immediately transplanted to the field. They claim that when plants are shipped from the nursery and packed as they should be, that they will do as well or better than when taken up and

Plants of Americus and Francis, Sept. 10, 1911.

immediately put out in the open field. We are of the opinion that we prefer the fresh dug, fresh set plants, but in these things, weather at the time of setting, as we have said before, has much to do with success or failure with plants, however treated.

Plants that are shipped long distances by mail or express or freight must be taken up carefully and exposed to the air as little as possible and shipped as soon after digging as practicable. Oiled paper must be used to cover all plants sent by mail and to line all packages that go by express or freight. Oiled paper prevents the evaporation of water, so necessary to keep the roots moist. In wrapping packages by mail, we advise cleaning off all unnecessary rubbish and tying plants in small packages. Plenty of damp moss must be used and a piece of card board bound about the package to protect the crowns from injury in transit. If the weather is cool or it is quite early in the season, we advise doing packages up tight like sugar, our experience being that they carry better than when the leaves are exposed to the air. Plants by freight or express must be packed in market baskets, or double slatted crates, lining same with oiled paper. We find old berry crates good for this purpose. In packing plants in baskets, we line the basket with a sheet of oiled paper and then set the plants or bunches of plants upright in the basket, tops to the light and roots down, with moss in the bottom and moss on the insides of the basket and between the layers of bunches. We are enabled to get 250 to 500 plants in market baskets packed in this way and they carry in the best possible shape. In using crates, it is best not to put over 2,500 plants in any one crate or package, as the tendency of all handlers of this kind of merchandise is to stand the crate or package on end, and if this is done, the contents will chugg down to the lower end and leave the plants partly exposed and will badly injure the plants by scraping against the slats and sides. Light, handy, small crates, like 32 or 36 quart berry crates, and at the largest, 60 quart berry crates, are the best and most satisfactory. In packing plants in crates, we put a piece of canvas in the

ends and pieces of oiled paper in the bottom and in the ends. In other words, where the plants are to touch the wood we cover with oiled paper. Moss is placed in the bottom of the crate or on the oiled paper and then a double row of plants put in on the moss, with the roots interlacing and the tops exposed to the air and side slats of the crates. Then another layer of plants is put in, more moss and so on till the crate is more than full. Moss and oiled paper are put on top, and the cover is crowded down, holding the plants firm. Packed in this manner, plants can be sent thousands of miles by express or freight. If the plants are entirely dormant and the season is cool, they may be packed in tight boxes, filling in between the layers of plants with damp moss or old sawdust. We dislike to use fresh-made sawdust as it is more liable to heat. Moss and sawdust are the best materials for keeping plants, but even these wil heat if just nicely moistened and the weather is very warm and the package is too much crowded. Avoid undue crowding, but be sure to have each package full, even if you have to fill out with excelsior or straw.

When Plants are Received from the Nursery

There are more losses and trouble caused by people not understanding how to handle plants that come long distances by express or freight than are caused by improper packing and carelessness at the other end. The nurseryman generally understands his business and there are few of them but that are in the business to stay. The fellow that is in it for one year is rare. On how he digs, prepares and packs his order, depends the nurseryman's chances for future sales, even though his desire to please the patron did not enter into the transaction. The nurseryman may put up the plants in the best possible shape and the transportation companies deliver them to the customer's door in the quickest time and if he does not understand how to care for them the plants may be easily destroyed or badly damaged, and however it comes out, the nurseryman has to stand the blame. I speak of this matter quite pronouncedly because it is dear to my heart. Nurserymen as a class are generally supposed to be plutocrats, or worse things still, by the average planter and are far removed from the realms of charity.

As soon as plants arrive at their destination, they should be taken from the transportation companies and carried home, being protected enroute from sun and winds. Arrived home, the planter should open the package in a cool cellar or shed and remove the contents, placing the moss of the package on the floor and setting the bunches on it in an upright position after first dipping them into a pail of water so as to wet the roots well up. When the plants are placed in a compact bunch, they should be protected on the outside with moss or wet straw until ready to plant. In this position they may remain a few days at any time of the year and if very early in spring, they may remain for ten days or two weeks. They should not be allowed to freeze if possible. If they do get frozen, or if they are frozen when they arrive, they must be put in a dark place, thoroughly wet down and allowed to thaw out gradually. It will be found that they will thus suffer very little by freezing. Plants can freeze quite hard when wet or moist, but when dry they are liable to injury, especially if not thoroughly wet down before thawing.

If plants are to be kept any length of time, they should be trenched in, closely together in the garden, and protected from the sun and winds by some sort of covering. If planted right out, the tops should be trimmed of leaves and runners, if this has not already been done, and the roots shortened to the required length, and then the plants can be placed in baskets lined with oiled paper, or in shallow pans with water in the bottoms.

Marking the Rows

Any method of marking that will get the rows straight and the required distance apart, is satisfactory. They must be straight for the looks and the fact that they are more easily cultivated. For the same reason is it better to have the rows the same distance apart. I dislike to see crooked rows, it suggests the drunken man to me, the most detestable condition a human being ever gets into. If the row is straight, very fine work can be done with either a one horse or two horse cultivator. It is almost essential to have the rows absolutely straight for a two horse cultivator. We have seen strawberry rows that were so closely cultivated that there was scarcely anything for the hoe to do after the cultivator had gone through.

However you mark, or whatever tool for the purpose you use, be sure that the outside row is straight and then keep the others just like it. You cannot generally make straight rows from crooked rows and the first one surely must be straight. The simplest method of making a first row straight is to set stakes in a line, on the outside of the field where the first row is to come; and then scuff the soil with the heel of the boot from stake to stake, keeping in line. The stakes can then be thrown aside and the horse marker made to follow this first mark.

We use a two or tnree-pegged marker on our stony soil with good results. The common corn marker is all right if of the proper distance. Some set with stakes through the entire field, changing them from row to row with an exact measure, others use a line and set just a little to one side of the line, being sure to keep the same distance from the line all the way through. Some use a wheelbarrow and others still, use a chain, dragging it through the mark or where the mark is wanted.

For field culture rows are made from 3½ to 6 feet apart. The farther rows are apart, the closer the plants should be set in the rows. For instance, if rows are made 6 feet apart, the plants should be set 1 foot apart in the row. If they are made 3½ feet apart, the plants should be set 2 feet apart, etc., etc. The farther apart, the plants are set in the rows, the less hand hoeing they will require for an acre but if one plant happens to die out, the space left vacant will be quite considerable compared to when they are set closer to-

Plants of Iowa and Rockhill's No. 16, Sept. 10, 1911.

It is our practice to mark the rows on our heavy soil and then cultivate them thoroughly with fine toothed cultivator and then mark again, just before setting the plants. We thus overcome the packing that the soil has received from man and horses tramping over it from day to day, and get it in the best possible condition for planting out the strawberires. Rows that are cultivated in this way on heavy stony soil, will set twice as readily as though the land was merely marked out after the last harrowing had been done. It also enables one to use plants with longer roots which reach to the bottom of the stirred surface, and they do not suffer from drought but start to grow right along.

People differ as to distance they prefer to set plants. The garden patch can be set closely because the runners may be largely removed and there is more time. gether. Some people set plants 3½ feet apart one way and 3 feet the other way and cultivate both ways early in the season. This is a good plan when growing for fruit alone, and in this case it is a good plan to set two plants, say four inches apart, where the marks cross, then if one dies, the vacancy will not be so pronounced. Some people are practicing setting the strawberry plants one foot apart both ways and keeping all runners off. All the work must be done by hand when following this method, but where land is limited and the help plenty, there is no question but enormous yields can be secured in this way. The plan is worth trying if only on a small scale.

The rule to find how many plants you can set on an acre is to divide 43560, the number of square feet in an acre, by the multiplied distance the plants are set both ways. Thus if you set 3½ by 2 feet,

you divide 43560 by 7, which will give you 6223. Our usual method is to set 5 by 1 and it takes 8712 plants. If you set 4x1, it takes a little over 10,000 plants to the acre.

Setting Out the Plants

Any method that will get the plants in the soil as near as possible to the way that they originally grew, will be satisfactory. The roots must not be doubled up and crowded into the holes, but they must be spread out as much as posible and put down straight with no particular crowding. If plants are to be taken right up and set out near by, one can dig holes for a small patch and take up the young plants with lots of earth on them and set in the holes made. The soil must always be firmed about the freshly set plants, not trodden hard, but sufficiently firmed so that too much air will not reach the roots to dry them out. There are various tools used to make the holes and aid in setting the plants. Some use the dibble, some the trowel, others the adz-shaped tool or common hoe narrowed up and with the handle cut off. We prefer the adz-shaped tool for our hard soils. The dibble and trowel may work as well on light, easily worked soils, but are not satisfactory with us. In setting with the adz-shaped tool, we get down on the knees and take the tool in the right hand, using the left hand for taking out plants from the pan and moving the pan along from plant to plant. In operating this tool, we strike the adz into the soil, and when removing it, we dexterously flit a plant into the hole back of the blade of the adz. Earth rattles back into the hole and with a forward push with the adz, we fill the hole about the plant and complete the operation. One man will set from 2,000 to 6,000 plants a day with this tool, depending upon his skill and endurance and upon the character of the soil. When set with the adz, the strawberry roots are not set exactly straight down but rather in somewhat of a slanting position. The roots can be spread out quite nicely, however, by this method, and the percentage of loss by dying is very small when a good man sets them. In using the dibble or trowel, a hole must be made and the plant inserted and then another hole made close down side of the original hole in order to crowd the earth up to the plant. Even if care is used to cover this second hole, there is more or less space left for air to creep in and dry out the plant. If rain comes soon, however, the percentage of loss is slight.

A favorite way with some people is to set with the garden spade. This is forced into the soil, pushed forward, and a plant inserted back of the blade of the spade. As the blade is withdrawn, earth rattles back into the hole and the plant is filled in about with the foot, or with a common hoe. If the work is well done and two people engage in it, one to use the spade and the other one to insert the plants, good work can be done and longer rooted plants can be used than by most any other method. Where the soil is loose, straight furrows can be plowed the required distance the rows should be set apart, the plants set in the furrow, up against the land side and earth filled in about them with a hoe. By this method they can be manured in the hill or row, with rotted manure or commercial fertilizers, much better than in any other method of setting we know. Where the soil is loose and open and the fields are large with long rows, very satisfactory results can be obtained by using machine setters such as are used by tobacco and cabbage growers. The machine sets the plant and waters it as it is set. One should have help to follow up the machine to fill in about shallow set plants with the hoe or to dig out those plants that have been set a little too deep. The team must walk slowly and evenly and all operators must be careful workers.

It must be remembered in setting strawberry plants that the crown of the plant should be placed just even with the surface. If it is set too deep, the tendency will be to smother and not do well. If set too shallow, the roots will be exposed and the plant will dry up.

Hand Cultivation

The strawberry requires a certain amount of hand cultivation and this is largely why its culture will always be exceedingly profitable. There is a growing tendency among farmers to avoid anything that has a semblance to real work. It makes me tired to see some people try to get out of work and actually work harder to get out of work than they would if they took the bull by the horns in the first place. There are some men who would as lieve cut their hands off as to take hold of a hand hoe and dress out a hill of corn or potatoes. These crops can be grown largely by machinery, but the strawberry crop cannot entirely be grown by machinery and this is why strawberries will always sell for a good price. It is true that the most of the work can be done with the horse cultivator, but fixing the runners and getting up close to the hills must always be done by hand and with the hoe.

It is hard to get men that can be taught to hoe strawberry plants intelligently. The most of them are in for "Big Things"and strawberry hoeing is too puttering a job for them. Generally speaking, a man that really likes to drive team

and fool around them is a poor man to hoe strawberries. We could mention other vocations that seem to unfit men for learning to hoe strawberries. There is something about the business that if a man likes to do it, he really likes it and if he dislikes it, he hates it. When I get new men I go into the field and show them how I want the plants treated. If I can once get a man interested I hardly ever fail to make him like the business. I can tell by working with a man a very short time whether he will ever do good work hoeing strawberries The fellow that goes about it as if he intended to master it will make a good workman and the one who seems fretful and as if he wished he was miles away, will never be any good at that business. It is no sign that because a man has worked at something quite different all his life, that he will not like the strawberry business. He may take to it for a change.

As soon as possible after the plants are set, they should be stirred or cultivated in some way. It is our practice to go over them lightly with a common hoe, merely stirring the surface very shallow right about the plants, close up to them and reaching out, say about one foot. This must be done carefully so as not to disturb the plants.

Different tools can be used for this purpose, such as rake, potato hook and common flat hoe.

In about a week they will need another hoeing and this time, it is well to get up a little closer to the plants and look out for fine weeds that are just starting. In about two weeks or more, they will require very careful and thorough hoeing, cutting away the earth and fine weeds from the plants and replacing with fresh earth about the plants.

The oftener they are hoed and stirred, the better will be the growth and the less real work there will be necessary to put upon them. A good rule to follow is to hoe them as often as seems necessary to keep the soil loose and open, the weeds down, and the plants in a good healthy growing condition. In this respect, weeds are a sort of blessing, they tell by their appearance when it is time to hoe the plants and although the weeds should be killed and removed, this is not near the only benefit derived from hoeing strawberries. Of course in hoeing, the runners must be carefully placed. Some people hoe their strawberries once, some twice, some four and some six times or even more than this. The man who hoes them oftenest, usually does it the cheapest, because he does the killing of the weeds before they get large enough to bother much in hoeing. It is a long hard job to hoe them when the weeds get tall and well rooted. In such cases, the weeds not only shade the plants, causing them to grow tall and spindling, but also use up much

Plants of Productive and Superb, photographed Sept 10, 1911.

of the fertility that otherwise should go to fertilize the plants and make them grow. I believe strawberries should be kept hoed and clean of weeds until growth stops in the fall. I do not approve of the idea of stopping cultivation in September to allow the plants to ripen for winter. My experience is that if cultivation is stopped in August or early September, the vines will be more liable to get full of blight or mildew and suffer in yield the following June. We believe they stand the winter best when cultivated and hoed up to the time that growth stops in the fall. For hoeing late in the fall after the runners are quite thick and almost entirely cover the ground, there is nothing better than a three cornered hoe, made by cutting off the corner of a common hand hoe. This can be used to stir in among the plants and kill the small weeds. If mouse-eared chick weed or other fine weeds come late in September or early October, the simplest method of destroying them in wide matted rows where the hoe cannot reach them, is to loosen up the soil between the rows with a cultivator and then haul this with a comon hoe right up onto the row of plants, covering the weeds and runners and small plants with one inch of soil. The young strawberry plant will grow up through, but most of the weeds will be smothered, and the ones that live over until spring can be pulled with the hands. There is one month in the year when it will not do to let the strawberry bed get weedy and remain weedy, and this is the month of August. In all other months you can neglect the strawberry bed somewhat and with a certain amount of persistence afterwards, clean it out and attain good results, but let it remain weedy and choked all through August and your patch is doomed. There is so much growth of weeds in this month that if left to itself the patch gets choked, the plants wither and grow spindling, the runner production is limited and the results are disastrous. Whatever else you do, take good care of the strawberry bed in August.

Horse Cultivation

Whatever you can do with the horses in these times of scarcity of help and their general unwillingness to submit to hard tasks even if you can get the help, is almost clear gain. In the first place, thorough preparation of the soil before the plants are set, is very important and prevents much hard labor afterwards.

After the plants are set, they should be cultivated at once to loosen up the soil, let in the air, and form the dust mulch. I advise shallow cultivation for the first three or four cultivatings with narrow inch teeth on the cultivator. If the soil seems to be quite moist or hard I believe in working quite deep with the cultivator. In dry weather cultivate shallow, in wet weather cultivate deep, because soil tends to dry out just as deeply as cultivated.

The narrow teeth on the cultivator are best to dig deep and do not throw the soil onto the plants as much as wide teeth. The wide teeth are better to cut off and kill weeds and should be kept sharp for this purpose. The cultivator can be used to stir the soil, keeping it loose and open, to kill the weeds between the rows, and also to turn the runners around close up to the row where they are wanted. They must not be allowed to run across the rows early in the season but should be kept in bounds and nothing is so easily done as to turn them with the cultivator. For this reason, the cultivator must always be run the same way in the row. Early in the season we cultivate twice in each row, going down on one side and coming back on the other. Later as the runners spread, we go but one way in the row and narrow up the cultivator as the row spreads. By fall, there is sometimes hardly room enough to get between the rows of plants, but even if thousands of them are destroyed, the cultivator must be run through to divide different varieties and keep them pure.

The Training of Runners

There is no more exacting work in all strawberry culture than the proper training of the runners. To do it right requires more than average skill and intelligence. For the reason that it is hard to get men that will handle the runners right, I am in favor of following the method of restricting runners to a certain number from each parent plant. If two, four or six new plants are allowed to form from each parent, strawberry culture, so far as the runners go, can be reduced to a more exact science, and most any man can be taught to do it right.

There are three ways to take care of the runners, one is to allow them all to grow. We call this method the Wide Matted Row. Where only a few runners are allowed to root and these carefully placed, we call it the Narrow Row. Where all are cut off we call it Hill Culture. All these different methods have their advantages as well as disadvantages. When the plant is first set. I believe it a good plan to remove the first four or five runners anyway, whatever method you pursue. I believe the removing of these first runners tends to throw the strength to the parent plant and it becomes stronger and stockier and more able to withstand the strain of runner production later on.

In wide matted row culture, the first runners that are allowed to grow must

be trained carefuly in all directions about the parent plants and held down with stones or earth until well rooted and fastened. After this, the runners will root and take care of themselves unless the weather is extremely dry. This first layering of the runners is very important, as often, if the first runner is not carefully placed, the young plants that grow from it will all fail to root and the runner and plants will be blown about with each high wind. In dry weather it with the knife or by pulling. You can grow the matted row quite slipshod or you can exercise the greatest skill in growing it, whichever is your inclination.

Whether you are growing strawberries for fruit or for the plants, the proper layering of the runners is an important item. If the first runners are gently pressed into the soft soil and held there with a stone or more earth, they will root quickly and by fall the young plants will have attained a size equal if not superior

Plants of Pan American and Autumn, Sept. 10, 1911.

is absolutely necessary to root all the runners if best results are expected. One man can go over a piece and put in about five to ten thousand tip ends every day and nearly every one will root, even though it be very dry. The cultivator can be used to place the runners and cover them with fresh earth when they will surely root, if the cultivator is manipulated as it should be in the hands of an intelligent, conscientious workman. In no place can a man shirk more than when running a cultivator. It is hard work if properly done. The wide matted row has the advantage of being easily handled, and the plants standing closely together and thus mulching themselves to a large extent, endure severe winters better than plants treated in any other way. If the plants are too thick when spring comes, they may be thinned to the parent plant. These large fine young plants are the ones that bear the big crop of fruit, I think they generally bear more fruit than the parent plant. If one is trying to get all the new plants possible, there is no other way quite as effective as layering each young runner in the fresh soil as fast as it shows the young leaves of the newly forming plant. I think it quite possible to double the production of plants during the season by proper layering of each runner.

When growing strawberries by the narrow row method, they may be set closer together. The rows should hardly be over 3½ ft. apart and the plants from a foot to 15 inches apart in the row. Strawberry plants do best when not too much crowded in the row. About six inches apart each way is a good proper distance. If the

first four to six runners are carefully layered between and at the sides of the parent plants, you will have a row sufficiently wide for all practical purposes and the plants will be just about right so far as distance apart is concerned. After these six young plants have rooted, all other runners should be cut away. When this method is practised, less energy is wasted, than by any other method that strawberries may be grown by. The surplus runners after this number of plants are formed, hardly ever produce plants large enough to fruit much, and if allowed to grow, are a nuisance. They act more like weeds, in sapping the vitality from the large first rooted plants than anything else. They should be cut off with shears or runner cutters made for the purpose, or chopped off with the hoe. When plants are layered in this way and all other runners are removed as fast as they form, they will be uniform and of the same distance apart and can be hoed and stirred about much more readily and by less experienced help, than when all runners are allowed to root as by the wide matted row method. The largest crops of the very best berries are grown by the narrow row system. When strawberries are grown in hills, the plants may be set closely together; as they never occupy much more room, except that they grow larger than when they were first set. We recommend setting them in rows about 3 feet apart and plants about 1 foot apart in the row, if the horse cultivator is to be used. If all the work is to be done by hand, we recommend setting about 2 feet by 1 foot. Some recommend setting 1 foot apart, both ways. 43,560 plants can thus be got on an acre and if the soil is rich and if plenty of moisture is maintained in fruiting season the yields will be enormous. If one plant averages to yield 1 quart, it does not take long to figure out what can be produced on an acre, but let every person who contemplates putting this plan into practice, stop and consider what it means to do all the hand work on 43,560 plants, and before he tries an acre, be sure to try a smaller patch. The runners in hill culture, should all be removed as fast as they get long enough to take hold of to cut off. No new plants should be allowed to root. The old plant grows large and forms innumerable crowns which bear immense crops of fruit, but the fruit on most varieties, will average smaller than in narrow or wide matted row culture. This method has the advantage of being handy for the man or woman who has a small piece of ground, and strawberry culture can be systematized more thoroughly than by any other method of culture.

The Sex of the Strawberry and what to do with Blossoms

Strawberry plants should not be allowed to bear fruit until they get well established and able to bear the crop. For this reason plants that are set in the spring or very late in the previous autumn should not be allowed to fruit until they make a season's growth. For instance, plants that are set in April or May, should not be allowed to fruit the following June. If plants are allowed to fruit the first season they are set out, they will bear an inferior crop of fruit and the plants themselves are weakened by the effort and will hardly make any new growth for the next season's fruiting. It is best to let them grow one season and get a good strong stocky growth of plants and then bear their crop of fruit which will be large and fine and much more desirable than the inferior crop that we could get the first year, at best. If, however, one cannot wait and must have fruit the first year, he can take up large plants with lots of earth on the roots and carefully transplant them so that there will be little set back and quite a good sized crop of fruit may be picked. It is better, however, to begin the year before. If best results are wanted, cut off all blossoms as fast as they appear, then you will get no fruit the first year.

The strawberry blossom has sex like animals and varieties having a combination of the two sexes must be planted beside those varieties that have but one sex to their blossoms. There are the hermaphrodites having the male and female organs, the staminates having the stamens or male organs only and the pistillates having the pistills or female organs only. The true staminate or male blossomed plant does not enter into actual strawberry culture. Like the drone bee, his only office would be to pollenate or fertilize the pistillate blossoms and as the hermaphrodites or bisexual blossoms accomplish this work just as well and at the same time bear a crop of fruit, the true staminate blossomed plant is eliminated from strawberry culture. The pistillate or female blossom has all the parts of a complete flower, but the stamens or male parts. Pistillate varieties must be planted near bisexual varieties in order to be properly fertilized and bear a crop of fruit. If left to itself the pistillate will blossom just the same but its seeds will not be properly fertilized and unless the seeds are properly fertilized the strawberry pulp about the seeds does not enlarge and we get nothing but the "seedy" nubbins. When a hermaphrodite or bisexual variety is planted near the pistillate, the pollen from the stamens on the bisexual blossoms is

borne by the bees or gentle zephyrs to the pistils of the pistillate variety, and the seeds are properly fertilized. Then is when we get the large, finely developed fruit. Bees are the most valuable agents in transferring the pollen from one flower to another. They inject their probosc's into the flower to get the sweet and in doing this become contaminated with the brown dust or pollen from the stamens of the flower which they transfer to the next flower, and so on. Bees work rapidly from one flower to another and fertilize many blossoms in a short time. Pollen is also borne to a small extent by the winds. Bees work much better in warm days and this is why strawberry blossoms are better fertilized when the weather at blossoming time is warm and sunshiny. Strong, cold, high driving winds dissipate and destroy the pollen and are very deleterious to the proper pollenization of strawberry blossoms. In the same way heavy rains and cold wet weather at blossoming time dissipate and destroy the pollen and by preventing the working of bees, tend to destroy the best effects of pollenization. Of course there are other insects that pollenize blossoms besides bees.

A Strawberry Blossom.

Pistillate varieties of strawberries are generally good yielders, in fact Warfield, which is a pistillate, has the record of bearing the largest crop of fruit, under test, of any variety in cultivation. Pis-

tillates are also hardier in blossom, they do not suffer so much as hermaphrodites by frosts in blossoming time. They are losing their popularity, however, with growers in general.

The hermaphrodite or bisexual strawberry has complete flowers, that is, they contain all the four parts of the flower stamens, pistils, calyx and corolla. These varieties will bear when planted alone and will also cause others to bear when planted close by them. In common language they are known as "staminates," "bisexuals," "hermaphrodites," and "perfect" flowers. They are the more dependable varieties and most everybody prefers to plant them exclusively instead of part pistillates. They are a little more tender in blossom, during frosts of spring, but they fertilize much more readily from the stamens of their own flowers and will bear crops of fruit even though it be rainy and quite unfavorable during the blooming period. When first I began to grow strawberries, there were few perfect flowered strawberries that ranked high as producers, our heaviest fruiters were of the pistillate class. Now, however, we have many varieties quite as productive as any pistillates. There is a reason for all this The strawberry is being constantly improved and the pistillate represents a state of transition from a lower to a higher degree. The perfect flowered variety represents a certain state of perfection reached. No one can truthfully say but what strawberry varieties have been much improved since I begun their culture years ago. I do not wish any one to think because I say this in the way that I say it, that I think I have had anything to do with this improvement, because I have not. While I have grown seedlings I never produced a variety that has been placed on the market. In planting staminates and pistillates close by each other in order that the former can properly fertilize the latter, there is a difference of opinion as to which is the best plan. If one does not care to use young plants from the rows for setting a new field, the best results are attained by mixing the plants of pistillate and staminate in the row, say set two staminate plants and then two pistillate, and so on throughout the field. The general practice, however, is to set two rows of staminates and two rows of the pistillates, alternately through the field. If the staminated variety is a strong staminate, good results can be reached by planting two rows of staminates and four rows of pistillates throughout the field alternately. As a general thing, pistillates will be properly fertilized if the staminates are 15 feet away, but bees, of course, will carry pollen quite a long distance. If the weather is such that bees do not work, the man who mixes his plants in the row will get better results than the man who plants alternate rows of pistillates and staminates.

Fertilizers for Strawberries

The proper fertilization of the strawberry is of vast importance and its application about as uncertain of results as the science of medicine. We have to deal with the soil, and no one can exactly say what is already in the soil or what are the exact conditions.

Generally speaking, there are three elements in most all soils that are usually lacking, these are Nitrogen, Phos. Acid and Potash. The strawberry, like all other fruits and vegetables, must have these elements in the soil in order to produce good crops.

Nitrogen makes the plants grow and also the fruit. When it is used in moderation the crop of plants and fruit is well balanced and the results are good. When used in large quantity, it tends to make an excessive growth of plants, with large tall luxuriant foliage, to the exclusion of fruit. If the soil has been made too rich by the application of nitrogen in the form of Nitrate of Soda or barn manure, the growth of plants will be excessive and there will be little fruit. Nitrogen also causes the fruit to grow large and soft. It is a good thing but must not be used to excess.

Phosphoric acid has almost the opposite effect on the plants and fruit that the nitrogen has. It discourages the growth of plants and forces them to early maturity and therefore into fruiting. It has much to do with the formation of the seeds. When used in right proportions the result is a large fine crop of fruit.

Potash strengthens the walls of the leaves and leaf stalks, makes the plants grow strong and sturdy, and has much to do in the formation of the fruit. While nitrogen seems to make the fruit large, potash makes it of some substance. It puts firmness into the fruit and has much to do with the flavor and color. When used in right proportions it has much to do towards increasing the character as well as the quantity of fruit.

Manure made from animals loses much of its value in handling and especially of the elements potash and phos. acid. These must be supplied in chemicals containing these elements.

In fertilizing strawberries, it is a good plan to begin several years before the plants are set out. If barn manure is applied to the crops of corn that precede strawberries, the land is not only got in an excellent physical condition, but sufficient vegetable fibre or humus and also nitrogen is derived from the manure to

make most excellent crops of plants and fruit. Humus is just as essential for good results as are nitrogen, potash or phos. acid. It enlivens the land and helps it retain air and moisture. There is no better way to get humus than by using barn manure.

After the strawberries are set out, I do not advise the using of animal or barn manure because I believe it is unbalanced and tends to induce fungous growth in the strawberry plants and fruit. The best fertilizers to use at this time are what are known as commercial or concentrated fertilizers. These come in bags, are readily handled and applied, and do not tend to induce a diseased growth of the strawberry plants or fruit. The amount to be applied and the proportion of the three essential elements to use in these fertilizers, depends upon the character of the soil and its present condition of fertility.

There is no absolute rule to go by in applying fertilizers to strawberries. I do not believe in using low grade goods because I think it is cheaper to get the same worth in 100 lbs. of fertilizer than it would be to get the same value in 200 lbs. of goods. I should not think of using a fertilizer much lower in analysis than 4 per cent. nitrogen, 10 per cent. potash and 10 per cent. phos. acid. This can be used at the rate of 500 to 2,000 lbs. to the acre, depending on the richness of the soil.

Our plan of applying this fertilizer is to put 1-3 on before the plants are set, 1-3 while they are growing and the balance in the spring of the fruiting year.

In applying fertilizer before the plants are set, we take it in pails and scatter on the mark by hand and then cultivate into the soil with narrow toothed cultivator. This thoroughly incorporates it with the soil and has much to do with the plants starting readily and growing right along. In applying fertilizers to the rows of plants while they are growing, we make it a practice to drop a handful between the plants and hoe it in by chopping the surface with hoe. It may also be put on the same way, just after a thorough hoeing. We prefer to put a handful on several times during the season at intervals of a month apart, rather than to put all on the plants at the same time. Be sure that none of the fertilizer stays on the leaves. It will surely burn them. When the rows get thick with plants, the fertilizer can be scattered over them and then brushed off with a broom.

In applying fertilizers to rows of plants in the spring, just before fruiting time, we scatter it from a pail just the same as when putting it upon the rows during the growing season, although we are not as careful, because the plants are dormant at this time. The best time to apply it is at the last snowfall in early spring when the plants and all are covered with two or three inches of snow. When the snow melts, this fertilizer is deposited at the roots of the plants, and the warm rains of early spring wash it down just where it is needed. This spring fertilization of the strawberry is very important. Often the yield of fruit can be doubled by just applying the fertilizer at this time. The whole amount should be scattered on at one time, not strung out into several applications.

Generally speaking, the more fertilizer applied to the strawberry fields, provided it does not injure the plants, the better will be the results. I have, however, known people to seriously injure their plants by applying too much fertilizer. Like all good things, it must be used with discretion and it is better to not put on enough than too much.

Old run-out strawberry beds can be rejuvenated and brought up to quite a productive state by applying about 250 pounds of Nitrate of Soda to the acre in early spring before fruiting. The crop of fruit is liable to be less firm when nitrate is used, and we recommend as better, 500 lbs. to the acre of a good well balanced fertilizer analyzing, say 4 per cent. nitrogen, 10 per cent. phos acid and 10 per cent. potash.

Insect Enimies of the Strawberry

Strawberry culture is not without its set-backs and one of the worst things to contend with is the insect known as the white grub. Its scientific name is Lachnosterna Fusca and while this sounds distinguished and dignified, there is nothing dignified or decent about the true white grub. The white grub is the worst insect enemy of the strawberry and no one is so smart or well informed that he always escapes their serious ravages. I have known growers to have a term of years of wonderful success in strawberry culture and then before they hardly knew it, they would have a dose of white grubs that would destroy their profits for two years. It would possibly be better, if my only object in writing this book was to create enthusiasm and get people to set out strawberries, to have little to say about the drawbacks of strawberry culture, and to eliminate the chapters on insect enemies and fungous diseases, but whoever goes into this business will have to run up against these two propositions sooner or later, and forewarned is forearmed.

The white grub is the larvae of the May bug or beetle, sometimes called the June bug. Most everybody will recognize this pest by its prominence during the months of May or June, depending upon

the year and the locality. It lies still and sluggish in the daytime and comes out of its lair in the evening to disturb people who are trying to read or otherwise perform work by a lamp. The way they will dash at you or your lamp reminds one of reckless automobilists running down human beings. They are just as liable to hit you on the nose as anywhere else, and as they are about an inch long and large in proportion, the effect is anything but pleasant.

The May bug seeks its mate in the early evening; this is its courting time. Afterwards their revelries would put to shame Nero of ancient Rome. Their excesses are so pronounced that the male dies. The female then goes into the soil, burrows down from six inches to a foot and lays a nest of eggs, about 200. Then she dies. These eggs hatch in a short time and the young grubs immediately begin eating. The first year of their existence they do comparatively little damage, living on the tiny rootlets of grasses and other plants. By fall they have attained a length of about ½-inch. Late in the fall, they burrow deeper in the soil, where they winter.

In the spring they come near to the surface, with the first warm days, and begin eating. The more they eat, the larger they get, and the larger the roots and plants they tackle. This is the year when they do the most damage. Strawberry growers, potato growers and farmers whose pastures and meadows have been chewed off by them, can testify to their ability to do mischief.

The white grub seems to have an especial fondness for strawberry plants. He will leave everything else in the line of vegetation to get to the root and crown of the strawberry and seems to get a flavor out of it as agreeable to him as the flavor of fresh strawberries is to human beings. While he will eat most any plant, and chew out the inside of potatoes, he prefers the strawberry plant to anything else.

They accomplish their devastation in various ways. Some begin at the lower ends of the roots and eat up to the crown, destroying the roots and finally the crown. Others will attack one side of the roots about an inch below the surface and eat right across, cutting off the entire force of roots, when the strawberry plants wilt and die. It seems to prefer the crown of the strawberry, as it will hang to this and eat after the plant has wilted and died.

There is no lotion, poison or spray that can be applied to the plants or the roots that will kill the grubs and not at the same time destroy the plants. We have tried everything and know whereof we speak. The only way to get rid of the grub is to dig him out. When by the partially wilted condition of a plant, you are pretty sure there is a grub side of it and you dig down to one side, you can generally find him and destroy him. It is easier to find them in the early morning and during the forenoon than late in the day. They are always near the surface after a rain, for the same reason. They prefer cool and moisture and it is hard to find them during a very dry time. We often find them around plants that have not yet been eaten enough to cause them to wilt. The plant will change color, become darker and less vigorous, and if we dig down by the side, we can generally detect the grub, get him out, and save the plant. I am not blood thirsty, and as a general thing, dislike to see an animal killed, but I have a certain fondness for destroying these pests; and my favorite way is to tear its head from the body and throw head one way and body the other, with a feeling that I cannot suppress, that this prevents them ever getting together again.

If the grub remains in the land throughout its second year of existence without being disturbed, it burrows deep into the soil late in the fall and winters there, coming forth to its work again in early spring. Thus we will sometimes find large plants loaded with blossoms and berries wilted and dying in the spring of the fruiting year. The grub continues to eat and degoes down into the soil and changes into stroy till about the first of July and then the pupa or chrysalis state and finally into a fully developed May Bug. In this place he remains until autumn, when they may be found as fully developed May Bugs. In the following spring they came forth and begin to mate and lay more eggs for another batch.

Thus it will be seen that it takes the May Bug three years to go through its different metamorphoses or transformations and it is for this reason that white grubs are more devastating some years than others.

If one will stop to investigate, white grubs are very plentiful every third year and they always come in great numbers the year after May bugs are very plentiful. There are a few May bugs and white grubs every year but the large crop of them comes periodically every third year. In our locality 1908 was a great grub year, strawberries, meadows and potatoes suffered great devastation. My first great crop of white grubs was in 1893, the year I was married, that is why I remember it so well, and I know that ever since that time they have come in regular succession, every third year. If we will keep in mind the years that the grubs come in great numbers and plan accordingly, we can save ourselves much trouble and expense.

May bugs have an intuition that is at once ingenious and wise. They seem to

understand that cultivated soil is not the place for them to lay their eggs, because if they did lay them there, many of the eggs would be destroyed by the cultivator. They seem to understand that uncultivated lands are the proper places for them to deposit the eggs and act accordingly. Hence we find them using old strawberry, raspberry and blackberry fields, meadows and pastures for egg depositories. They rarely lay eggs in clean, fresh, plowed or harrowed soils. Knowing this habit of the May bug, we take advantage of it by cultivating the land to some hoed crop like corn or potatoes previous to setting out the plants. If the land happens to be in cultivation the year they lay eggs in large quantities, the bugs will avoid it and this piece can be set to strawberries with safety the next year. If the land is lying idle and uncultivated the year that the bugs are laying the eggs, it must be avoided for strawberry planting until the grubs work themselves through the various transformations and come out again as May bugs, which will be the third year. Of course continued cultivation, plowing and harrowing from year to year, will destroy many of them, but the surest way is to let them work out themselves. If they have once laid their eggs in the piece, there will always be enough left to do much damage even though the piece be given thorough overhauling. Plowing late in the fall, just before a hard freeze will kill many of them. Patches of land near trees are more frequently infested with white grubs than wide open areas.

I stated in the fore part of this article on the white grub, that there were no preparations that would poison or kill it without at the same time destroying the plants. Every now and then I read of some fellow who has discovered a preparation for killing the grub, but when you sift the matter, you will find that the grub has passed through his different metamorphorses and passed away as a May bug and the nostrum had nothing to do with his departure. People will salt their fields, put paris green on the plants and do all manner of things, the grub works out his own destiny and passes into the May bug and they think their nostrum has destroyed him. The truth is, it had nothing to do with getting rid of him. Were I a fakir, I would get up some preparation for killing white grubs and advertise it. I think it would take better than the pedigree plant idea. The secret of success in business is to fill a long felt want. The reason that grubs cannot be destroyed by poisons is that he works on the roots and if you dig away the earth and poison around the plant in sufficient quantity to kill the grub if he comes, it will kill the plant and too, grubs won't attack plants that are heavily poisoned. If plants are very slightly poisoned, the earth and soil waters will dilute the poison so that after a few days it is worthless. It must be remembered that the grub is after strawberry plants and not poison and he knows enough to get what he wants.

L. J. Farmer's Children Picking and Sorting Fall Strawberries. Photographed Sept. 1910.

In addition to white grubs, there are numerous insects that prey upon the strawberry plants, leaves and roots. These insects rarely ever give widespread trouble but are mostly local, attacking the strawberry plant mainly because their supply of usual food is limited. If lice or other sucking insects attack the leaves or roots, kerosene emulsion can be used with good effect. If rose bugs attack the leaves, they can be picked off and destroyed. Other leaf eating insects may be destroyed by an application of some arsenical poison. It must be remembered that whatever injures the leaves or roots of the strawberry affects the crop adversely in proportion to the injury done. Therefore it is necessary to keep these organs of the plants in good condition.

Fungous Diseases

There are two fungous diseases that infest the strawberry plant and fruit, and they are known as strawberry leaf blight and mildew. While caused by practically the same thing, they are different in appearance. Both are parasitic fungii that live on the strawberry leaves and develop most pronouncedly during warm, muggy, wet weather. The same conditions that would bring about an extra large crop of berries, provided the mildew and blight were not present, are most congenial for the growth of these fungous diseases. We want warm, moist weather to mature a large crop of berries and these fungous diseases need this same weather to complete their work of greatest destruction. It would seem, therefore, that any agent that would destroy or prevent these fungous diseases would allow a large crop of fruit to form and mature. This agent is Bordeaux Mixture when intelligently applied.

It is hard to describe these diseases so that the unsophisticated can identify them when they see them. Each disease has about the same effect on the crop of fruit. When blight is well developed on the strawberry plant, the leaves will have numerous spots all over them surrounded by red blotches. When mildew has attacked the strawberry plant, its leaves curl up and look sickly. The fruit stalk develops but one good specimen, early in the season, but the fruit rapidly dwindles in size afterwards until the berries last formed from the blossoms do not attempt to develop, but dry up on the vines. The keeping qualities of the fruit that partially develops are injured and it rapidly deteriorates when placed on the market. If blight and mildew attack the strawberry patch square in the face, the crop will not be 25 per cent. of what it should be.

Now these diseases come from several sources. They are transferred on the plants when set from one field to another, they are caught from contaminated plants near by, and they are borne by the winds and on the legs of birds and insects long distances. Generally speaking, the dormant spores are present on most all strawberry plants and only await favorable weather conditions to develop. They are on the plants the first year they are set into the field as well as in the fruiting year.

Strawberry plants need to be sprayed the year they are set out as well as the year that they fruit. If they are not sprayed the year they are set, the disease may develop and weaken the chances for a crop the next season, even though the fruiting season be ideal. There is no definite time when to spray, and the number of times to spray, cannot be put down with accuracy. It must be remembered that spraying with Bordeaux Mixture is not a cure for the disease, but a preventive. It acts on the plants just like paint acts on a house. The one keeps blight and mildew out, the other preserves the house from rains and climatic changes.

In spraying the second, or year of fruiting, the plants need to be treated soon after they have started to grow and kept well coated until the berries are about half formed. The Bordeaux may be made with the usual formula of four pounds lime, four pounds sulphate of copper and 50 gallons of water.

It will be observed that on sprayed plants, not only will the yield of fruit be larger and finer and of better quality, but the plants will put on a different appearance. They will start to grow with a renewed vigor, and after fruiting, especially if spraying is kept up, they will not die down to the ground as strawberry plants usually do after fruiting, but will remain growing and in good condition, making many new and vigorous plants for next year's crop of fruit. The cost of spraying strawberries is inconsiderable compared to the great benefits to be derived. Small patches can be sprayed with knapsack or bucket sprayer, but large patches should be planted in long rows, a convenient distance apart, and power sprayers, the same as are used for potatoes, that will cover several rows of strawberries with Bordeaux at once, should be used. Vessels used to prepare Bordeaux should be made of wood or earthen and all working parts of spraying machines should be made of brass, as iron is rapidly corroded by Bordeaux Mixture.

Winter Protection for the Strawberry

It is poor policy to work over a strawberry bed all through the spring, summer and fall and then neglect to cover them

for the winter. The work of a whole year may be destroyed by a few days of unfavorable weather if they are not properly mulched. Strawberry plants need to be mulched in winter, not to keep them warm, but to prevent the damage that always comes from sudden changes in the weather, notably freezing and thawing of early spring. Maple sugar weather is very destructive to uncovered strawberry plants. If they are left exposed to the freezes and cold blasts of winter, the plants are injured beyond remedy. If they are heaved up by the freezes of spring, they might about as well be plowed under. Strawberry patches are not nearly as weedy in fruiting time if they have been mulched for the winter, especially if the mulch has been left on the plants until quite late, it seems to smother the first crop of young weeds and the strawberry plants are thus given a greater chance.

When the strawberry bed freezes, the whole mass, plants, earth and everything, is expanded, forced upwards. If the plants are uncovered when it thaws, the earth will settle back, but the plants remain up on top and do not go back with the earth. If the patch is sufficiently covered, the earth and plants will settle back together, and plants will not be injured by freezing and thawing. Of course, when properly mulched the process of freezing and thawing is retarded and it comes over the plants with less abruptness and they do not suffer so much from sudden changes. The sudden freezing and thawing of uncovered strawberry beds not only heaves out the plants, but it breaks the roots and mangles the plants so that the crop of fruit is never so large as it would be if the patch was sufficiently mulched.

The best time of the year to mulch strawberry beds is as near December 1st as you can get at the job. They should not be allowed to remain uncovered until midwinter, because they may be very much injured before that time and it is harder to hold mulch in place when the winds are strong. If covered too early in the fall, warm weather coming on later may start the plants and make them less hardy and they may winter kill because of being mulched prematurely. I have seen patches that were turned yellow and spoiled when mulched too early.

If the field is large, it is best to allow the ground to become frozen hard enough to bear up team and wagon, then you can drive anywhere and deposit the material where wanted. When the hard freeze comes, it is a good plan to get out plenty of help and cover them up before there is time for a thaw. The material must be got onto the bed in some way. If the hard freeze does not come early enough, one can draw mulching material along the edges and cover them before the ground freezes, reserving the center of the patch until later. Small patches of strawberries can be mulched at any time after you are sure that warm weather is over, after the first of November. We prefer to cover before the hard freezes if possible, as we believe freezing of the plants when they are uncovered, injures them at any time of the year. It is sometimes a good plan to put on a thin covering at first and cover deeper later on, when the weather gets very severe. Any coarse material that will not injure the plants and does not contain weed seeds, will do for covering strawberries. Straw is the most common material used, and is very satisfactory. We prefer wheat straw to anything else. Oat, barley and buckwheat straw are very good, but must be as free of weeds as possible. Marsh hay is an ideal covering, so are brakes and evergreen boughs. Leaves held in position by brush, can be used on small patches. Horse manure can also be used, but must be well forked over and allowed to warm up, so as to destroy the rawness of the manure and kill the weed seeds. Manure can be put on in the winter when other materials would blow away. Fall-set plants, and plants grown in hills, can be nicely covered with earth and will winter just as well as when covered with straw. The earth should be put on late in November just before the ground freezes solid, and removed in early spring, just as the plants begin to start. About one inch of soil is the proper covering. It can be removed in spring by scraping off with a common hoe. The thinner plants are distributed over the surface of the ground, the deeper and more thoroughly they need to be mulched. Strawberries grown in hills and narrow rows, where the plants are far apart, need twice the mulching material applied to them that plants in wide matted rows need. If snow blows over exposed places and does not lodge, you can catch it and hold it in place by building loose board or rail fences. If snow would come in late November and stay until freezing and thawing was over in spring the plants would need no other covering.

Strawberries should be uncovered in early spring, before they have started to grow much. In our locality, we uncover fruiting beds about May 1st. If uncovered too early, the late freezes will surely injure them, and if left on too late, the plants are sometimes injured by smothering. It is a good plan to go over the field and stir up the mulch when the first warm days come, so it will not settle too closely over the plants, and then remove it when it seems to be absolutely necessary. We think it a good plan to leave the mulch on the field, placing most of it between the rows, but

leaving a thin covering over the plants to aid in conserving moisture and to smother any weeds that may be coming up between and among the plants.

Spring Care of Plants

The spring fertilizing of the strawberry field must be done before the mulch is removed from the rows or shortly afterwards. It is not a bad idea to scatter it right onto the straw and let the first rains wash it down among the plants. If put on after the straw is removed, we would be a little more careful not to get a large quantity in any one place, especially on a plant. The broom can be used to remove fertilizer from plants and scatter it more evenly through the rows.

If plants are to be dug from the rows, they must be dug as early as possible, so that the earth will have time to settle back and become firm. The later you dig plants, the more it disturbs the fruiting plants left and injures the crop. All stirred or dug over space must be well covered with mulch to prevent it drying out.

There is a difference in opinion as to the wisdom of spring cultivation, some good authorities advocating it, others seem to think it is of no real value. I do not think it injures the plants if done right, and am quite sure it is beneficial. In cultivating in the spring, the cultivator must be set so as to dig shallow, not over an inch or so, and run through the row until the surface between the rows of plants is entirely stirred over.

In cultivating a field that is mulched, we begin on one side, remove the mulch and place it on the adjoining land. We cultivate the first row and then take the mulch from the second row and place it in the first row, then we cultivate the second row and place the mulch from the third row in this, so on, throughout the field. Of course the mulch from the first row must be carried around and placed in the last row cultivated.

Just before the berries begin to turn color, it is a good plan to go over the field and place mulch under the leaves on the outside of the rows of plants, and cover all vacant spaces. This must be done very carefully and thoroughly and if well done will pay for itself many times over. It is surprising the difference in quality and quantity of fruit produced, when strawberry plants are thoroughly mulched.

All perennial weeds like dock, thistles, etc., should be pulled and removed from the patch at this time. In pulling weeds right beside strawberry plants, it is well to hold the plant down with the foot when the weed is being pulled, and then it will not be disturbed much. In pulling weeds, try and select a wet time after a heavy rain, when the soil is loose and the weeds will pull readily. If hand weeding of the rows is practiced, it must be done before the berries begin to show color, if it has not already been done earlier in the spring. Mouse-eared chickweed is the worst weed to contend with in strawberry culture and this should be removed in early spring, or it will choke the plants and injure the crop of berries.

Protection from Frosts in Blossoming Time

Blooming time with the strawberry grower is the most anxious time he has to go through. If frosts come at the height of the blooming season, the results of a whole year's work will be swept away. The damage done is in proportion to the severity of the frost, its duration and the time that it comes. If a light frost destroys the first few blossoms, there may still be a large crop of blossoms and fruit later on. If after the blossoms have set and the young berries have formed, we have a slight frost, the damage done is light. There seems to be a delicate time, just as the white petals open, when the strawberry blossom will stand hardly any cold. This is not only true with strawberries, but with currants, apples and all other fruits that are entirely hardy otherwise. When strawberry blooms are frosted, the center turns black and dies, although the petal may remain white and promising for days.

The best way to combat frosts in blossoming time, is to avoid them. To do this, we must provide frost drainage. Strawberries should never be set in a hollow where there is no outlet from its lowest part to some place below. It don't make any difference how low down a piece of land is, if it has an outlet for the air to pass off and down into a place farther below. We might say that if land is well drained of water naturally, it will have a sufficient frost drainage. The low wet piece that has no outlet for water is hemmed in by hills, and frost, like the water, settles in this on cold nights, when higher altitudes are immune, and you lose your strawberry crop. This is why we advise setting strawberry beds on the hills and side hills, the air is constantly passing over them and down into the valleys and the damage from frosts is avoided. Large level pieces are also dangerous because there is a stagnation of air in such places. Strawberries are usually in blossom in our locality about the last of May, and generally the nights of May 27th, 28th and 29th are anxious ones for the strawberry growers in this locality.

Frosts seem to attack plants more fiercely that are mulched heavily between the

rows and directly around the plants. This is probably due to the fact that such plants are in a more succulent state and an easier prey to frosts than plants that are standing out in the open with no straw about them, the latter making a sturdier, hardier growth. Even if this is true, we would not cease to mulch.

If one has sufficient warning, he can sometimes save the strawberry crop by covering the rows entire with straw from the middle and leave it on the plants for a day or so until the weather moderates. The plants can also be covered with blankets and other available coverings when the patch is small. Large strawberry growers often build fires to save their fields from the frosts. We have practiced this with good results ourselves. If a fire is built at the lower edge of a strawberry field, it will draw the air from the entire surface of that field to take the place of the air about the fire which has been heated and forced upwards. A current is set in motion and the damage of frosts avoided. We prefer one or two great big fires with much heat, rather than several small ones. Some think that the smudge idea is the correct one and arrange things so that coal tar drips into the flame, causing a smudge which settles over the entire field and prevents the frost coming.

The cleaner the plants are of weeds and grasses, the less liable they are to suffer from the blossoms freezing. A well cared for patch will often be immune from frost in blossoming time, when a neglected, weedy, grassy patch will be entirely destroyed. Pistillate or female blossoms seem to be hardier than hermaphrodites or staminated blossoms and suffer less from frosts in blooming time.

A Group of Berry Pickers.

Picking and Marketing Strawberries

Most anybody can pick strawberries in some way or other if they are going to eat them themselves, but berries that go to market must be picked and handled right or the profits from strawberry culture will be small. If grown for home use or nearby market, where they are sold and consumed the same day or the day after, strawberries can be allowed to ripen thoroughly and will not only be larger than when picked before entirely ripe, but will be sweeter and of better flavor and therefore more saleable and more liable to create an appetite for more fruit. The best market is the home market and after the family is supplied, the home market must be worked for all it is worth, before seeking the distant market.

If strawberries are to be shipped long distances, they should be picked before thoroughly ripened, just when they are nicely colored up and before they have lost any of their firmness. They should be well colored but not quite up to their best flavor. The first berries I ever shipped to New York, I picked two crates red and two crates quite green and sent them at the same time. I had heard so much that you must not pick berries for shipment too ripe. Quick as a flash, back came the telegram,—"Pick berries red, green ones hard to sell."

The cool of the early morning and the forenoon is the best time to pick strawberries. I prefer even that they be picked while it is gently raining than to have them picked in the afternoon when the sun is boiling hot and the atmosphere very warm. Some growers provide oil cloth capes for their pickers so that they can work in the rain during rush times in strawberry picking. Men are sometimes more desirable than women as pickers because they can go out among the wet vines when it would be unsafe for women to attempt it.

In picking strawberries, the berry itself should be handled as little as possible. I prefer that it be not touched at all. The best way is to pinch off the stem about 1-2 to 3-4 of an inch in length with the thumb and forefinger nails, and taking hold of the stem, gently place the berry in the basket. Pickers that pull the berries off and cannot be induced to pinch them off with a half-inch stem, should be avoided as much as possible. All inferior, unripe, and rotten berries should be thrown away and not placed in the baskets.

For picking berries, we use stands that hold four quart baskets. These are made like a shallow box with no legs to catch in the vines, and have strong handles, that the picker can rest on them somewhat, when rising from the row.

As soon as the berries are gathered by the picker, they should be carried to the packing shed and there looked over and placed in the crate. The same men that carry the berries to the shed, can also attend to the pickers, giving them rows and punching for the berries picked. We use a tally system with cards and punch. The pickers must be warned that they pick the berries clean and do not wallow in the row. They should be kept in their proper places and watched that they do not put undesirable fruit in the baskets. It is a good plan to have cards with the name of the picker, placed in each picking stand or "handy" so if the berries are found to be "off" in any way, the picker can be identified. It is a good plan to impress upon each picker the fact that you know your business and that he cannot fool you. Strawberry pickers as a class are not angels and most of them need to be watched. Once in a while you will find a conscientious person who would not beat you if he or she had the opportunity, but these instances are rare. Picking strawberries seems to develop trickery and dishonesty in a person if there is the least germ of these diseases in his make up.

When the berries arrive at the packing house, they should be gone over carefully and if any undesirable fruit has been put in the baskets, it should be removed. If dishonest pickers are discovered, they should be discharged, if for no other reason, as a warning to others. If the berries are to be assorted into grades, it must be done at this time, when they are fresh-gathered from the vines. The baskets must be leveled off and fixed so that they look nice. All vacancies and uneven places in the basket must be filled and levelled up. The baskets must then be set into the crate and the partitions put in until the crate is full. When a few crates are filled, they should be drawn to some cool place and stored until ready for shipment. If they are intended for home trade, they should be got to town as soon as possible.

The best place to keep fruit after it has been gathered, is some dry cool shed or house cellar where there is no moisture or bad odors. The berries should be drawn in spring wagons to this storage place, the tops of the crates thrown open to allow the warm air to pass off and the crates set one row deep on the bottom of the cellar or storage room. All light and air should be excluded from the room by day, but the doors should be thrown open at night. No sun or light should be allowed to fall directly on the fruit after it is picked except that which is absolutely necessary in getting it under cover. Heavy winds are very deleterious to freshly picked fruit; they discolor it and make it dark and unattractive. Keep the fruit, after it is picked, away from sun, air and winds.

If the berries are to be shipped to a distant market, it is best to draw them to the station in the cool of the evening after the sun goes down. If they are cool when loaded, it is best to cover them with some tight cloth or blanket to keep the cold in as much as possible. On arrival at the station, they should be loaded into the car as soon as possible and the doors closed. Most every fruit growing center now has refrigerator car service and the berries after being placed in the car need no further attention until they arrive at the other end.

In shipping berries to distant markets it is better to encourage buyers from the large market towns to come to your locality and buy the berries from day to day. If you have an opportunity to sell them

before they are shipped, you have a chance to get what they are worth, but when they are shipped to distant markets on commission, you have to depend upon the honesty of receivers who have everything their own way. One should be very careful to select good commission houses and treat them fairly. It is not wise to try and beat them by putting in inferior berries in the bottoms of the baskets or crates. Every crate should be as uniform as possible. Commission men are pretty well informed about their business and you rarely can beat them and if you do once, you will have to pay dear for it in the end. It is a good plan to send to the same house every day after you are pretty sure that you have a good house. You should put your business in their hands as much as possible and abide by the results. It is a good plan to visit the city when possible and see berries handled from other places. You can learn much from the methods employed by others and get a better idea of the requirements of the market. It is also a good plan to invite the commission man to visit you, just a little before or during fruiting time and let him see your berries grow and show him how you take care of them. This may lead to a bond of friendship between you that will be worth while and fruitful of very good results later on.

Strawberries should always be handled carefully and if the transportation companies don't leave a car at your station for you to load yourself, with your fruit, you should stay at the station until the train comes along and help load your berries. You will save them much rough handling and have the satisfaction of knowing that they were handled right at your end of the line. I prefer that my berries be placed on the bottom layer of the car where they will get less rocking. There are generally four tiers of crates placed in each car and the top tier suffers the most because it gets the most rocking in transit. It is not generally understood, but the top tier of baskets in each individual crate suffers the most in transportation. It is unwise to put your small berries in the bottom of the crate and the large ones on top because the top berries will be damaged the most. If you do either, it is better to put the best berries in the bottom of the crate and the poorest on top and instruct the commission men of this fact. The best way is to have all baskets, all layers and all shipments as near uniform as possible.

Don't send to Tom one day, Dick another day and Harry still another day. Send your berries to one man from day to day. If you divide shipments to see which man does the best, do this every day.

Keep well posted on the condition of the market by following the daily press, by telegram and telephone. If any market seems to be getting all your neighbors' berries, try and find another place to ship yours. Don't think that because a certain market goes to pieces one day that it will be bad all the rest of the season. Generally it will recover in a day or so and be better than some other markets for the rest of the season, for the reason that many shippers will avoid it.

Have your crates and all shipping packages well stencilled with your name and address and mark all shipments plainly, showing where they are going, with the name and address of the consignee. Mark each crate showing what variety it contains.

The best shipping packages for strawberries are open slatted crates that hold 32, 36 or 60 quart baskets. The 32 quart crate holds just a bushel and is about the handiest crate for one man to handle that we know of. The 36 quart crate exposes 12 quarts to each layer and is considered a better crate to make sales from, but is not so easily handled as the 32 quart crate. The 60 quart crate is so large that it needs two men to handle it and when properly handled is a very desirable package, being large and showing a full 15 quarts to each layer. It is a good crate to sell from and usually carries the berries to market in good condition. One advantage in it is that it is about as large in capacity as two ordinary crates and when you sell a crate to any one you have disposed of quite a quantity of fruit in one package. Most retailers in small towns can dispose of one 60 quart crate each day.

Whether it pays or does not pay to keep over old beds and fruit them another year, depends largely upon circumstances. If one has but a limited space to grow strawberries upon, it is quite necessary to keep the plants bearing in the same place for several seasons. As a general thing, the commercial grower had best pick one good crop and then turn the beds under for some other crop. If the crop has been a comparative failure, due to being frosted in blossoming time or by over feeding with highly nitrogenous manures, it will generally pay to hold the beds over until another year and let them fruit. Sometimes with proper fertilization and care, the strawberry bed may be made to bear a better crop the second year than the first. The berries, however, are generally inferior in firmness, size and color, the second year of fruiting. The person who has but a few in the garden can hold them there for most any length of time by carefully renewing the plants and proper fertilization.

There are several ways of renewing strawberry beds, but the first thing to be considered is to regain the health and vigor of the plants. The rough and ready method

of burning over beds after fruiting to rid the plants of diseases and insect pests is often practiced by large growers. As soon as the berries are all picked, a mowing machine is run over the field and all vines and rubbish clipped off. This is allowed to dry, and when the winds are right and you are sure that there is no danger of the fire spreading, one corner is touched off and the flames sweep over the strawberry bed, burning everything dry enough to burn. The field is then allowed to stand for a time, preferably until a good rain comes, and then furrows are plowed between the rows, two furrows turned away from the rows and towards each other like back furrows. A spiked toothed harrow is now run over the bed both ways several times until the furrows are leveled and the earth between the plants thoroughly dug up. The bed is then allowed to rest a time and when the plants start up a little, a cultivator is run through the rows, the plants are now cleaned of weeds and fresh earth is drawn about them. They should now be thoroughly fertilized with about 500 lbs. of good commercial fertilizer to the acre and if the new foliage is not perfectly healthy, it is well to spray it with Bordeaux. They will require but little attention until winter, except to run the cultivator through them occasionally until growth stops in the fall.

One of the best methods we have found to reclaim old beds is to cultivate the alleys after the last pickings have been made and not plow the ground at all. The cultivator should be widened to cut a path as wide as is needed and all large weeds in the row of plants should be pulled. All rubbish dug up by the cultivator, should be carried off the field. The vines should be thoroughly fertilized and sprayed with Bordeaux Mixture. If this cleaning out process is done as soon as the last picking of berries is made and the row of plants is narrowed down to six inches, the plants will send out numerous new runners and form quite a row of new plants. The oftener they are cultivated and the more thoroughly they are fertilized and sprayed, the better will be the new growth.

Small patches can be renewed from year to year by allowing the young plants to fill in between the rows after fruiting is over and then destroy the old bed of plants. This is a very good method to follow if you have a small plot of land. By this renewing method a strawberry patch can be kept in the same place for many years, provided it is well cared for, fertilized and sprayed. Only the young plants that grew the year before are allowed to fruit each year, all old plants being destroyed after the new row of fruiting plants is formed each year.

Generally speaking it is best to plow the strawberry bed under after one good crop is picked. This should be done just as soon as the last picking is ended. Such quick growing crops as cabbage, turnips and buckwheat can be planted on the old strawberry bed. Buckwheat is one of the best crops to plant on the strawberry bed that we know. It cleans the ground of weeds and rubbish and gets it in the best possible shape for future crops. The high culture, extra fertilization and care given the strawberry bed, puts the land in excellent condition for future crops, and cabbage, celery or any high feeding crops, do exceedingly well after strawberries. We have seen wonderful crops of timothy hay, and all other kinds of crops grow nicely from year to year on the abandoned strawberry field.

The New Strawberry Culture

The new strawberry culture consists in taking plants up early in the spring and trenching them in or in heeling them in, whichever phrase you prefer to use, closely together, in little beds, and keeping them there until about the first of June, and then setting them out in the field permanently. The advantages of this method are many. One man can heel in ten thousand plants in a day and perhaps it would take him nearly a week to set them out in the field permanently. If the weather is unfavorable when the plants come from the nursery they can be trenched in and watered and saved, when if transferred directly to the field, perhaps a large percentage of them would die. The ground can be got in better condition, all rubbish removed and many weeds killed before the plants are finally set upon it. Whether the plants come from the nursery or are taken up directly from one's own patch, they should be in good condition and as near dormant as possible. For this reason, we advise getting plants in the fall and trenching them in, if impossible to get them early enough in the spring; especially is this true for the warmer sections of the United States and elsewhere.

In trenching strawberry plants, we open little furrows with a shovel or spade about 8 inches deep and slanting just a little so that when the plants are set in, they won't tip over but will stand upright. The string that holds the bunch of plants is cut, the plants spread out and placed upright, the crowns on an even with the surface and about ½ to 1 inch apart in the row, depending upon how long you wish them to remain there. The closer the plants are set in the rows, the sooner they must be removed. As each handful of plants is put in, we push in a little earth to hold them upright and when the trench is full of plants, we fill in with earth and tramp beside the plants with the foot to firm the soil. A little loose soil is scat-

tered on top, and then we call the work of one row finished. The next row is made in just the same way, about 6 to 8 inches from the first, and so on, till three or four rows are trenched in. Then a space of one foot or more of land is left for a path and another set of little rows are put in. As fast as the plants are trenched in, we cover them with blankets or old sacks to keep the sun and winds from drying them out. When the plants are all put in, we scatter fine straw between the rows to act as a mulch to prevent the plants drying out and also to shade the plants for a few days until they get well established and growing nicely. We take old bicycle crates and tack on strips of canvas made from feed sacks and find these very convenient for shading the trenched-in strawberry plants. It is no trouble to get about ten thousand plants on a square rod of land.

The Author Trenching, or Heeling In, Strawberry Plants.

These plants should be watered when necessary and sprayed when they seem to need it. They will soon start root and top growth and in a few weeks will be green and growing and can be set out at any opportune time.

The field where the plants are to be finally set, should be given the best of cultivation. It should be plowed several times if necessary, and harrowed until smooth as an ash heap. Towards the last, it should be cultivated very shallow so the moisture will be near the surface. This continued stirring, sprouts and kills many of the weed seeds; and when the plants are set out there will not be as much labor required in killing the weeds and caring for them during the rest of the season and, best of all, two or three of the first and hardest hoeings will be entirely avoided. Being constantly stirred, the soil is in the best possible condition, and the plants are most easily transplanted.

When ready to set the plants, we mark the ground as wanted and take the plants up with earth clinging to the roots and set them out. It is a good plan to wet the little beds down thoroughly and then more earth will cling to the roots when the plants are taken up. It will be found that that the plants are free from mildew and blight and when transplanted they start and grow right along, seeming to have recovered in the little beds from the shock that strawberry plants often seem to suffer when taken up and transplanted ordinarily. By fall, these plants if well cared for after transplanting, will make almost if not quite the number of new runners and young plants that plants set in April by the old method would make, and the labor in caring for them has not been what it would be by the old method.

If plants are left in these beds too long, they get tall and spindling. For this reason we advise spreading the plants farther apart in the row, when they are to be kept later than June 1st. When the work is

done right and at the opportune time, the results are very satisfactory. For the north, we advise trenching in April or forepart of May, but in the south we prefer October or November. We have never advanced any idea that we consider of so much value as this 'New Strawberry Culture" idea. There is hardly a well informed fruit grower or nurseryman who knows of it, who does not now put it in practice, and I was the first to advocate it at the Western New York Horticultural Society meeting of January, 1892.

When plants come long distances and they arrive in poor condition, it is almost impossible to save them without special treatment. If they are planted right out in the open field, unprotected, the chances are that most of them will succumb to the elements. They must be well watered and shaded, and there is no way that it can be done so economically, as when set temporarily in these little beds. Then there is no way that they can be sprayed so economically as when trenched in closely together. It would take a lot of time and material if one had to spray 10,000 plants if set out permanently on an acre, but when heeled in on one square rod, it can be done quickly and with little spray material.

At first, we recommended this method for those who were rushed with general farm work and had very little time to attend to setting the strawberry bed at the usual time. Not only could the plant be saved and cared for, but they could be held until the rush of spring work was over and an opportune time came for setting them out permanently.

Now, we recommend the treating of plants in this manner on a large scale by commercial growers, as well as those who have little time to attend to it in the usual season. The plants recover from the shock or set back in these little beds, they are free from fungous diseases because sprayed with Bordeaux in the little beds, and when set out permanently in the field about June 1st, they never stop growing, and as this is the most favorable time for everything to start and grow, they do better than when transplanted at any other time.

Fall Setting of Strawberry Plants

For the north, we recommend early spring planting or else transplanting to little beds temporarily and then planting out in the field later on as has been explained, for the commercial grower. To those who wish to grow the finest and largest specimens, or who wish to grow a few berries for the family, we recommend fall as a good time to plant. The worst thing about fall planting is that it is hard to get good plants at a reasonable price at this time. If plants are dug in the fall, a great number of young insufficiently rooted plants must be thrown away in order to get the few plants that are sufficiently rooted. For this reason nurserymen must charge double or even more than double the usual spring prices. If setting in June or early July, the best plants to be had are those that have been trenched in as has been before indicated. If these are not to be had, the old plants that have just borne fruit, if healthy, are the best. These, if carefully planted, will grow and make good rows by winter.

If you can get well rooted runners from plants that have been set before, preferably the fall before, these will make good serviceable plants and will grow several runners each before winter and bear fine crops the following June. I have taken up young runners from spring-set plants about August 1st and set them closely together and got nice fruiting rows by winter. The berries grown from summer or fall-set plants will average larger and each plant will bear its full capacity. When you see plants offered in the fall and advertised to bear a full crop of fruit the following year, it means that each individual plant will bear its full crop, not that fall-set plants wil bear as much as spring-set plants, acre to acre. There is no way that you can get as large a crop of berries, with as little effort as to set them out in the spring and let them bear the following spring or summer. The summer and fall set plants will bear nice berries, but we can hardly recommend setting plants at this time for the commercial grower, or for the practical house owner. Those who have plenty of time and don't care so much for practical returns, can try fall setting and get good results, for they count the pleasure of tending the plants fully as much as the berries they get from the plants.

Pot grown plants are of particular value only to those who are inexperienced and do not reckon the cost. If ordinary plants are treated intelligently, they will bring better results than potted plants. In potting plants, small earthen pots are sunk to the rim in loose soil beside the parent plants, and the runner trained so that the young plant will root in the pot, instead of the open ground. When it is sufficiently rooted, the runner is severed from the parent, the plant and pot removed to shade and shelter for a few days, and then knocked out of the pot and shipped, or set out in the field. The process of rooting is greatly facilitated if the runner beyond the pot is nipped back and not allowed to grow. Plants rooted in pots, are called potted plants; and those rooted in the soil naturally, are called layers. We prefer the layer plant because its roots grow nat-

urally in the soil, while the potted plants' roots wind round and round in the pot and become pot bound, not doing well sometimes when transplanted.

Pickers and How to Get Them

The question of getting competent help to pick strawberries is a serious one in some localities. The same class that used to pick strawberries when we first went into the business are not to be had in large numbers for this business at the present time. This is largely due to better times and the fact that this class of workers are otherwise employed. The best class of people in this town used to pick strawberries for us. I mean by this the best people of all those who made it a business to work out; and I consider this class as good as any people in any walk of life. Wives of farmers, mechanics, and other workmen, students from the Academy and high school, used to make it a business to help us out in strawberry picking. In fact, there are few successful young people who have grown up in this vicinity during the past 20 years who have not picked berries for us. I believe I have paid the first money that young people have ever earned, to more boys and girls than any other business house in this vicinity. I used to tell the boys that they would have to pick strawberries for me in order to be successful in life. The fact is, I have seen many of these youngsters turn out pretty good. These people were of good morals and most of them worked for what there was in it and used the money earned for good purposes. The reason that we are not able to get such a large number of this same class now is that they are employed in business that keeps them going for a longer time and at better wages than they used to get. There is also a feeling existing among young people and shared largely by their elders now-a-days that actual work is too hard business for the boys and girls and they spend most of their vacations loitering around, or off at summer resorts working, where they are sure to learn things that are anything but good for them. We used to take pretty good care of the boys and girls and treated them just the way we would like our own boys and girls treated. We made it a business during the noon hour to have sports and games going on most of the time after the lunch was eaten, and I recall with much pleasure some of the stunts the youngsters would make in riding bicycles, in sack race, potato races, etc.

There is a chance at the present time to get students from high schools and colleges for picking berries in many localities. These people are generally clean and moral and make good help.

I advise getting pickers in the locality where you live if possible. They can be more readily depended upon than strangers and will do better work as a rule.

In some localities it is possible to get gangs of Italians or other foreign help to come and pick the berries. In such cases it is best to provide living quarters for them and employ their leader as boss, doing business with him alone and making him responsible for their work. American bosses do not handle the foreign element as well as one from among themselves.

In some sections it is possible to get professional strawberry pickers who make it a business to pick berries almost the year around. They start in at Florida or Texas and work towards the North, arriving at a new locality just as the berries begin to ripen. The trouble with these people is that they usually do not get to the locality until quite a few berries are too ripe and leave before the latest pickings have been made. If one can get home pickers to gather the first and last pickings, these floating pickers can be used to harvest the main crop to advantage.

If one fails to get pickers in other ways there is always a last resort and this consists in advertising in the city daily papers or getting them through employment agencies. It is surprising to know the number of people who hire out to farmers through employment agencies. There is a certain class, and this class is rapidly growing from year to year, who make it a business to go to the agency to secure employment when they run out of a job and want another. The grape growers and apple growers of Western New York depend upon these agencies largely to get their supply of pickers each year. The boarding houses of some cities where there are employment agencies are crowded with these people for two weeks before harvesting begins waiting for the apples and grapes to ripen, so they can go to work.

An advertisement in the want columns of the city newspaper will secure all the pickers anybody will need. I live 38 miles from Syracuse and I have turned away hundreds as a result of a little 25 cent notice in two of the Syracuse papers. They would come on the cars, on bicycles and some would even walk out. Many that rode the bumpers on freight trains would be caught by the constables when they got off the train at Pulaski and serve a term in the local lock-up as a preliminary introduction to the balmy air of Pulaski and Maplewood Fruit Farm. Some of these people hired their board in town, others with the farmers near by and still others lived in the barn and cooked their own food, gypsy fashion.

It must be remembered that workmen as a rule are like sheep, they like to go

in flocks, and therefore it is easier to get together a lot of them than it is a few. If I employ a dozen men, it is easier to get them together than when I employ only one or two. In the same proportion, it is easier to get a hundred or thousand together than it is the dozen. Where there is a lot of help, each job is a short one and they go from one thing to another. Then man is a social being and likes companionship.

It is better to employ both men and women than either sex alone. The women exercise a refining influence on the men and they are generally more conscientious workers. On account of her nature, however, it is sometimes impossible to get a woman to do work that must be done at a certain time, and this is just where the man comes in handy. Strawberries must be picked regularly or there is more or less loss. If you ask a woman to go out in the rain, or after a rain when it is quite wet, it may mean sickness and possibly death to her, whereas a man can do the work with comparatively little inconvenience to him. If men are careful workmen, they can get through the vines more readily and not wallow them down so badly as women.

The man who handles pickers, must at all times be on his guard and let them know who is in authority. He must have a quick, alert mind and be able to take advantage of opportunities. If crises arise, he must be able to handle the situation in a masterly manner. Strikes and disagreements can be almost always averted by the execution of a little tact on the part of the manager. It does not pay to keep a man or woman around who is continually finding fault and setting up others, although that particular person is himself a good picker. The person who is sure to cause trouble, if kept, must be allowed to go before he has a chance to do mischief. The shrewd boss can soon spot him, and if he does not himself, there is always some fellow who will come and tell you. It never pays to keep help that is not earning what you pay them, even though you have a job later on that requires their services very urgently. The inefficient workman should always be let go as soon as possible. The ones that do the most and therefore earn the most money, are the ones to keep. Persons of immoral character who flaunt their business and advertise themselves before others should be avoided and if you get one, they should be got rid of. There is nothing more demoralizing than a bad woman advertising herself among strawberry pickers.

Probably the most satisfactory way to pay pickers is by the quart. The usual price is 1½ cents per quart, and board, or 2 cents without board. This is for the season through. Pickers earn good wages at this price. It would possibly be a good plan to pay a little more per quart for the first and last pickings and less for the main pickings, making it to average the same as where they were paid so much for the entire season. It is not hard to get pickers to gather the first pickings, although the berries be quite scattering and scarce, but it is always hard to get them to clean up the last berries. The last pickings are just as important as any, and usually more important, because being scarce, the price is better.

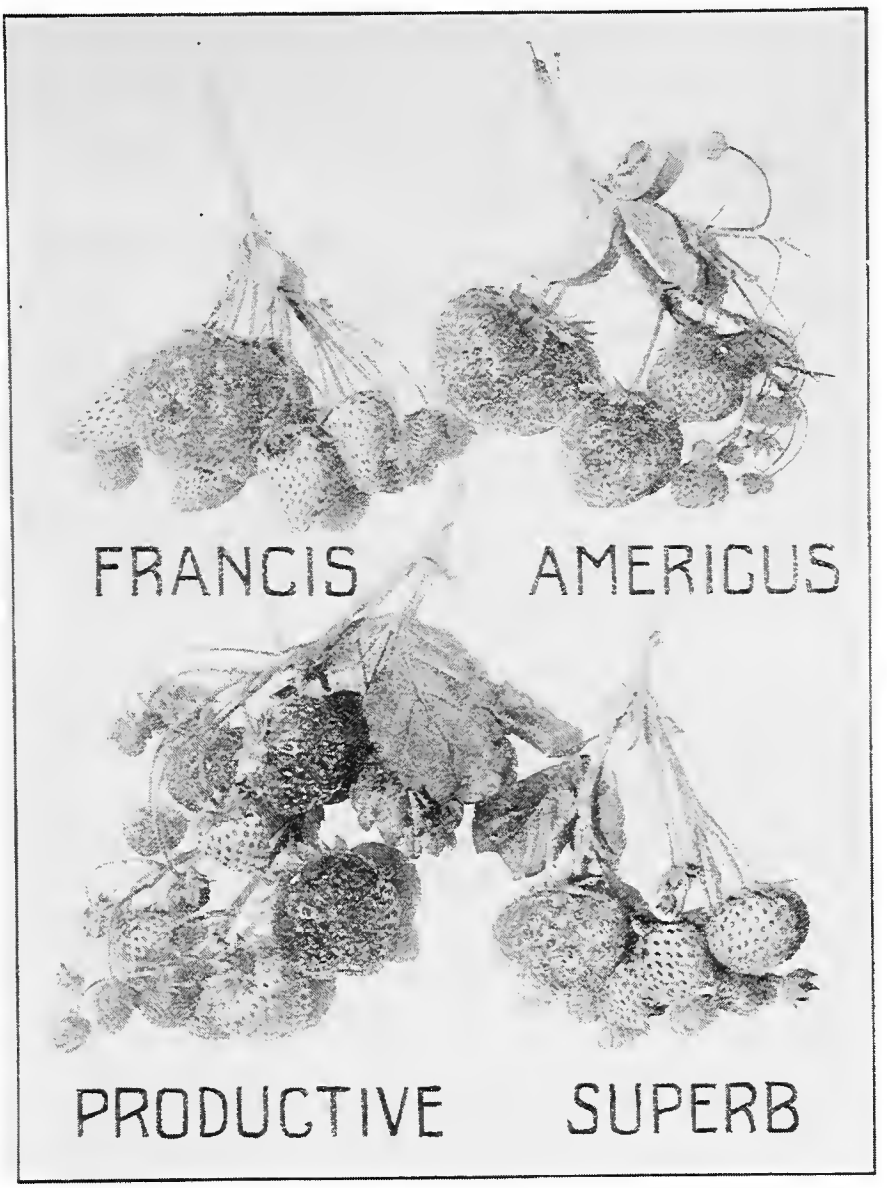
It is a good plan to have plenty of men help during the picking season. These may be hired by the day to hoe or do other work. When the great big picking days come, they can be put to picking and are often valuable to depend upon, should there be contingencies arise, such as strikes, pickers getting sick and so forth.

The Question of Help

I have briefly hinted at the question of help in growing strawberries, in another part of this treatise. Of course, it is the most important question of all, but like the social evil of society and the proper care of the bodies of young people, just budding into manhood or womanhood, this question is usually avoided by the average writer, because it is delicate.

When one can do their own work or have it done by others equally as interested as themselves, because of the same kin, such as father or son, the conditions are ideal. Usually, however, these conditions are rare, and the person who does all his own work or even has it done within his family, needs necessarily to cut rather a narrow swath.

I have often thought of a combination of circumstances where there was a large family and the farm seemed to be too small for all the boys and girls. In such cases, some of the boys and girls go to the city and engage in work that eventually turns their thoughts away from the farm and from farm life. I like to think that farmers' children should be taught to be farmers and remain farmers all their lives, instead of the idea of using the farm home as an incubator, to raise boys and girls to replenish the city with brain and energy. I think that if the country-born boys and girls could be induced to remain in the country, that in time, the city would fall behind the country in progress. As it is now, the best boys and girls from the farms largely go to the cities to build them up, and the failures in the cities come back to the farms to replace these boys and girls that ought to have staid on the farms in the first place. Farmers ought to encourage their boys to take up side lines in farming.



Stems of Four Varieties of Fall Bearing Strawberries, photographed Oct. 10, 1911.

There is no crop grown on the farm that will return a greater income than strawberries. The amount of work you can put upon them and yet get good returns for the investment, is almost unlimited. If the boy who thinks of going to the city would engage in strawberry culture, he would soon find that the returns from a few acres, even after paying the father good rent for the use of the land, would be very much greater than the city salary and further than this, he would have the satisfaction of having plenty of pure air and sunshine and of being his own boss.

If one has to depend upon hired help, the best is the cheapest in the end. The incompetent person, even if paid low

wages, will always do something that he ought not to do or leave undone something that he ought to do and be a disappointment.

Labor is an uncertain element in any business, and generally speaking, cannot be depended upon. You can go out and buy tools and fertilizer of certain makes and grades and get what you order, but the human being that you employ, is like a cat in a bag or possibly like the woman you marry,—an uncertain element.

A good foreman among a gang of men is all-important. Your foreman can make or break you. Men are 75 cents per day men, $1.00 men, $1.50 men, possibly $2.00 per day men. Price paid does not always make a man. The fellow who has always got $1.50 per day, may not be worth a cent more if you raise his wages 25 cents per day. It may make him worse. Men should be dealt with as individuals and not collectively. If a man shows that he takes an interest in your work, the more he can be left to himself the better.

The strawberry business requires alert help and those who are able to take quick steps and push things when it seems necessary. The person who is always dragging around behind everybody else, had better be let go. The careless, never-do-things-right fellow should also be avoided.

I always advise getting American born help when possible. Our own people understand us better and what you save in wages by hiring foreigners, you lose in their not carrying out your instructions intelligently, because they don't understand. If one has quite a lot of work to be done, foreigners can be employed; and when worked in gangs, with a good foreman, they are quite satisfactory. The foreigners that have been used to working in the soil of course are the best, because they are more liable to like the work they have always done; and are not so readily taught a new thing as Americans.

If you can get hold of men that are trying to get ahead, are saving their wages and husbanding them, you will generally have good careful workers.

The great trouble with unsatisfactory help is that they don't try to save anything and the more wages they are paid, the worse it makes the matter. It works in this way. If a man spends all he gets hold of, he will work more days a week if he is paid $1 per day than he will if he is paid $1.50 per day. It takes him generally 50 per cent. more time to spend the $1.50 than it did the $1 and so he works just that number of days per week less. I think that the majority of help that spend all their wages as fast as they get them, are more contented on moderate, than they are on high wages. High wages benefit the industrious, saving class of help, the kind that all of us would like to get if there was enough to go around.

Whether you should hire by day or by month, depends upon circumstances. The man with a family who can board himself is usually the most satisfactory, because most everybody enjoys the privacy of his own home. The month hands are more to be depended upon to be around when you want them.

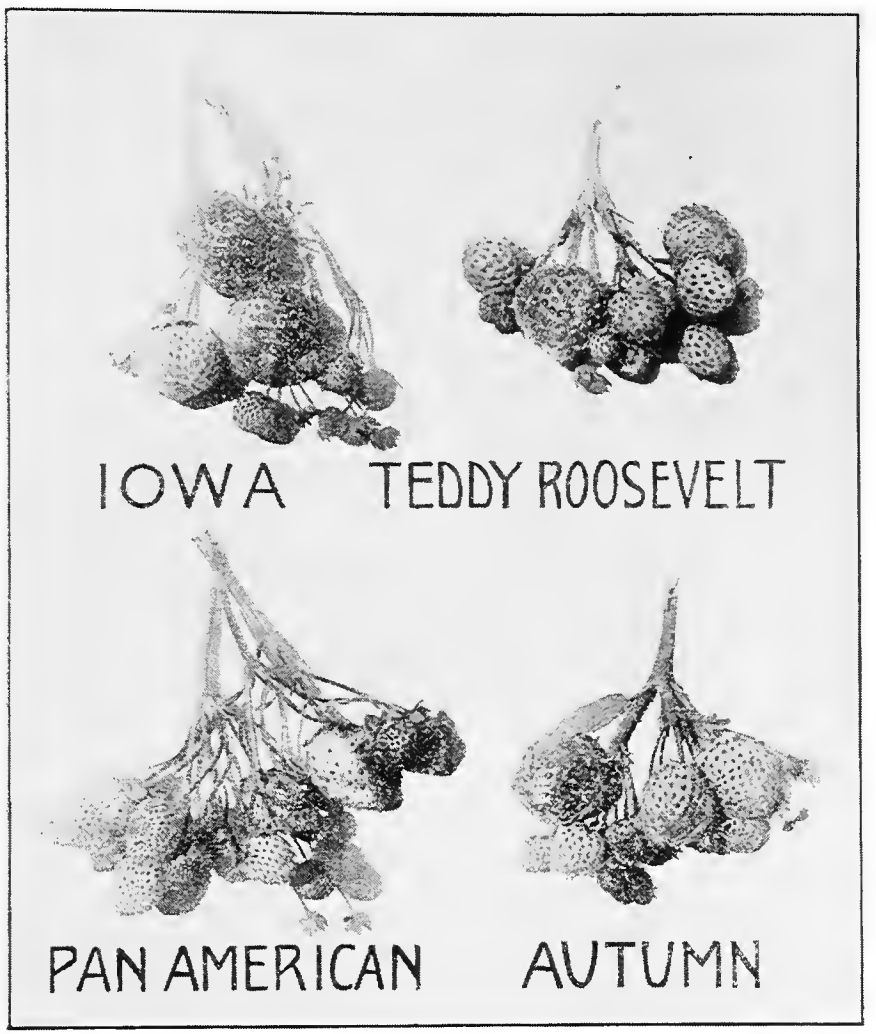
The Variety Question

The variety question is one of the very important questions in strawberry growing, but each one must settle that question largely himself. A variety may be a great success in one section and an entire failure in another. If I should take space here to describe and recommend certain varieties, I might do more harm than good. Soil, culture, location and various other things, determine whether a variety succeeds in any particular locality or not. Mr. "A" takes the Marshall and gives it high culture and congenial surroundings. He makes a howling success of it and by the way, everybody around there will plant Marshall next year. Mr. "B" don't understand the requirements of the Marshall, he gives it indifferent care, poor soil and uncongenial surroundings and makes a failure of it. However, this same man may succeed quite well with Dunlap or some other common variety. There are varieties that do quite well on low wet soils, but the most of strawberries require well drained upland to do their best. There are varieties that succeed best on clay loam and others that do best on light sand or gravel.

If berries are grown for market, that is, distant markets, they must be of varieties that are naturally firm and stand shipment well. If grown for home use, the question of firmness has little to do. Firm berries are usually better to can. The red-clear-through berry is also best to can. Different sections of the country have their favorites. Varieties that are popular along down the Atlantic coast below New Jersey, are not usually much in demand at the North or West. One of the most popular late berries in cultivation is Gandy, but this has never been much planted in Oswego County where I live.

Each grower must determine what varieties he will plant himself. If there is a successful strawberry grower in your locality, go to him and ask his advice on varieties, provided you have confidence in him. If you do not wish to ask advice of a person whom you may possibly be a competitor of some day, send and get a few plants of several varieties and test them yourself. It don't take over a dozen of a kind to make a test, and by the time

you have fruited them, you can have more plants and can set a larger bed. Your main plantings should be selected from varieties that are a success practically everywhere and there are such varieties. I believe in testing a few new varieties every year to find out which are best. Varieties of strawberries are improving every year, and if you don't believe it, just ask any grower who has been at the strawberry business for 20 or 30 years. The varieties that seem to do well everywhere, are few in number. I might mention as the two most reliable, the Senator Dunlap and Sample. Other varieties that will generally do well if given the right conditions, are: Warfield, Haverland, Marshall, Aroma, Gandy, Stevens Late Champion, Wm. Belt, Bubach, Splendid, Earliest, Brandywine, Beeder Wood. In this list I have confined myself to old well established varieties.



Stems of Four Varieties of Fall Bearing Strawberries, photographed Oct., 1911.

Growing Exhibition Berries

If berries are grown for mere show, the soil must be very rich in all the essential elements and the plants must have the very best culture. Summer or fall set plants will produce the largest specimens, as a general thing. If weak liquid manure is used with discretion, the plants can be kept growing at all times and will not suffer

from droughts. If the plants suffer for moisture, the berries will not attain full size and will ripen prematurely. When the berries are nearly grown, they may be much increased in size, if shades are put up to prevent the direct rays of the sun from touching them. It must be remembered that the sun colors and ripens the fruit, and if the process of coloring is somewhat lengthened, the berries will keep on growing and not ripen up quite so quickly, hence their size will be enhanced. It must be remembered that size in this case is generally at the expense of color and firmness, and one needs to use great discretion if he shades his exhibition berries, or they will rot before coloring. All berries that are to be shown, must be handled very carefully. If they are to be taken any distance, we advise wrapping each specimen in cotton wadding. It will not do to pack them in quart baskets unless each berry is protected with cotton. Most everybody knows of my exhibit of strawberries at the World's Fair in Chicago in 1893. These were carefully picked in the early morning, each berry wrapped in cotton wadding (not batten) and then packed in egg crates, each berry in a compartment by itself. We used large pieces of cotton wadding that entirely enveloped the berry. It was found that the cotton absorbed the excess moisture thrown off by the fruit and the berries carried and kept perfectly. They were kept on plates and shown eleven days after their receipt in Chicago. Cotton wadding and not cotton batten should be used. The former is glazed, but the latter is not and will stick to the berries, making them look as if they had "whiskers."

The Strawberry Business of Oswego County

All great strawberry sections have good reasons for their existence. The climate of Oswego County is tempered by the waters of Lake Ontario largely, the ice in the lake in spring, keeping back vegetation, which of course, would not be very forward anyway, in this latitude of Northern New York. Berries from this locality ripen and go onto the markets, after almost every other section that produces strawberries in large quantities for market, is wound up. For this reason, our berries are in great demand, and bring good prices.

The strawberry business was started in Oswego County about the year 1866. The first varieties grown were the Early Scarlet and varieties contemporaneous with that kind. Next came the Wilson, which has been a great berry in this section, in its day. Later the Crescent and Buback came in and each has largely had its day. The varieties grown mostly now are Dunlap and Warfield for canning; Sample, Dunlap, Marshall, Glen Mary, Stevens Late Champion, Oswego, Corsican and Rough Rider for shipping.

Curiously enough, the first shipments of strawberries were made to Montreal, Canada, by boat. Then trains were chartered and shipments made to New York and Philadelphia. The express companies now handle the shipping business and train loads are sent to Boston, New York and Philadelphia. Car lots are sent to different cities all over the east and some shipments have been made to Chicago and cities this side.

The train starts from this section about 10 o'clock at night and arrives at Boston, New York or Philadelphia, the following night, ready for the early morning market. Refrigerator cars are used and these are stopped enroute for re-icing when found necessary. The berries, if in good condition when shipped, will arrive at the other end in splendid shape. The charge for transportation is usually about 75c per 36 quart crate.

Most of the berries are sold on the markets in Oswego City and other shipping points; buyers coming from the cities to purchase the fruit and incidentally, to enjoy the cool bracing atmosphere of this locality. A variety that is much sought for by buyers, is the Atlantic; but as this is so hard to grow, very few are produced and they are hard to get. Crates of this variety often sell at $7 to $9 each at wholesale and when retailed, sometimes bring enormous prices. We heard of a crate of this variety being sold to the late Governor Flower for 45 cents per quart. It was shiped to New York City and then re-shipped by express to his home in Watertown, N. Y.

Generally speaking the large producing varieties are the most paying. The Bubach has been a great money getter. With a few, the Marshall has responded wonderfully and brought fancy prices, especially when the baskets have been wrapped in parchment paper to protect them from dust and air. At the present time, the Sample is being largely grown and also the Glen Mary, Dunlap, Champion and Oswego.

The strawberry business brings a good deal of money to Oswego County in one way and another, the growers are generally prosperous and much better off than the general run of farmers. I could mention names of parties who have made wonderful successes in the business, paid off their indebtedness and have good farms and farm buildings, who just a few years ago were quite "Under the Hammer." Oswego County offers exceptional advantages to young people who wish to engage in this profitable and healthful industry.

RASPBERRIES

Among berry fruits, the raspberry ranks next to the strawberry in importance. In season they follow closely behind strawberries, the early varieties of raspberries lapping on with the late varieties of strawberries. The same general directions for selecting the location and soil and preparing it apply to raspberries as to strawberries. The raspberry will not thrive in quite as wet soil as the strawberry, however, but must have well drained upland to do its best. The ideal soil for most varieties, is a good sandy loam or light gravel.

There are three general types of raspberries in cultivation, the red, black and purple varieties. The white or yellow kinds are albinos of either the red or black varieties.

Red raspberries are distinguished in bush by their upright growth, which is generally slim and tall; and particularly by the way the young plants increase from the roots. The roots send up numerous sucker plants, which are used for setting new patches. These young plants are more numerous during the first few years after the plants are set out.

The black raspberry is trailing in habit of cane the first year they are set out, but afterwards grow more upright, although they are never as quite upright growers as the red varieties. The fruit of the black varieties is generally firmer than the red varieties. The young plants are produced by burying the tip ends of the canes in the soil early in autumn, when they root and form new plants.

The purple varieties of raspberries are very similar to the black raspberry in growth of bush, but this is generally larger and more vigorous, in fact the purple varieties are the most vigorous and productive raspberries in cultivation. They increase from the tips like black raspberries. but the fruit resembles the reds largely in texture, although it is firmer. The purple raspberry seems to be a sort of cross of the blacks and reds, but is inferior to both in flavor and appearance.

The red raspberry is more difficult of culture than the other raspberries, but the flavor of the fruit is very superior and because of this, and the fact that they are not quite as productive as other raspberries as generally grown, the red raspberry brings the very highest prices in market.

The black cap is a better bearer than the red raspberry generally, but suffers much from disease in many localities. It is very popular for evaporating as well as for table use.

The purple raspberry is not as generally understood by consumers as either of the other kinds and until the people are educated to them, they do not sell as well as other colors. Their great vigor and productiveness, however, make them popular with growers, who prefer to take less per quart for them, because so many more quarts can be grown to the acre.

The rows for red raspberries should be marked 5 or 6 feet apart and the plants set from 1 to 5 feet apart in the row, depending upon the kind of culture that is to be given. If they are to be cultivated both ways and kept in hills, they should be set 5 or 6 feet apart both ways. If they are to be grown in a narrow continuous row, we advise setting them from 1 to 3 feet apart in the row. Personally, we prefer to set them 1 foot apart in the row, because a good fruiting row can thus be secured one year earlier than if set 3 feet apart in the row. There is no tool more adapted for making the trench in which to set the plants than the common farm plow. The land should be first marked and then the plow run where the row comes, about 8 to 10 inches deep, so that earth will rattle back into the furrow and the young plant will be set on loose soil. When the young suckers or canes start, all should be shaved off with the hoe, if it has not already been done with the cultivator, except those in the hill, which are needed for growing the new crop of canes to fruit the next year. When the canes get about 1 foot high, they should be nipped back by removing about an inch of the end of each cane. This can be done with the hand or by shears. This nipping back causes the canes to branch and grow spreading, like a tree, instead of tall and spindling. The nipping back also causes more fruit buds to form and of course they will be nearer the ground than if the cane was allowed to grow natural. The short stocky canes will winter better and the crop of fruit will be better, than when the canes are allowed to grow tall and sprawling, which they will do, if not nipped back when small.

The second year of their growth, the canes should be nipped back when 18 inches to 2 feet high, for the same reason. They will require the same treatment from year to year. The old canes that have fruited, should be cut out, removed from the patch and burned to destroy disease spores and eggs of insects. Red raspberries will need to be hoed quite thoroughly the first year and possibly the second, and all young sucker plants cut out and destroyed; but afterwards, most of the work can be done with plow and cultivator. The one horse plow should be run through in early spring and this followed with the cultivator. The cultivator should be kept going as often as seems necessary, except in

picking time. If the soil is mulched with some coarse material under the rows of plants, out as far as the cultivator reaches, the weeds will be largely kept down and moisture will be conserved. All perennial weeds, like dock and thistles, should be pulled when the land is wet, like after a rain. In digging plants to set a new patch, we advise doing it late in the fall after growth stops, or early in spring. If the young sucker plants are taken up when 6 or more inches high and set in rows and cultivated, they make nice plants for setting out the next year. Such plants are called transplants. Plants that are dug from the fruiting patch in spring or late fall, between the rows, are called suckers. A good yield of red raspberries is 2,000 to 5,000 quarts to the acre. The price runs from 10 to 30 cents per quart and even better.

Black and purple raspberries are generally set in rows 6 to 8 feet apart and from 1 to 5 feet apart in the row. If to be cultivated both ways, they must be set 5 to 6 feet apart in the row and kept in hills. If set in continuous rows, we advise setting closely together, say 12 to 18 inches apart in the row. Set this close, the canes grow quite thick and being small and withy, they do not break off with the winds. When the plants are set 3 to 5 feet apart in the rows, the roots send up fewer canes and these grow large and brittle and are more liable to be broken and raspberry one and one-fourth inches in twisted off with the winds. In such cases they must be tied to stakes, or a large percentage of the plants will be destroyed. We have found canes of the Columbian diameter, as large as walking sticks. It is very easy to twist these large canes off at the base, unless one is very careful. When set thickly in the row, the fruiting surface is more extended and the crop of fruit is larger.

Black and purple raspberries need to be nipped back the same as red raspberries and for the same purposes. This is not quite as essential the first year, although the crop of plants will be larger when they are nipped and thus made to branch more freely. The cultivator can be made to do most of the work, same as with red varieties, after the first year. The rank growth of canes, when they are leaved out, will shade the soil under the rows and very few weeds will grow, except a few docks and thistles, which can be easily pulled. All raspberries must be frequently cultivated, to keep them fresh and growing, and hoed as often as is necessary, to keep the weeds from getting a start and choking the plants.

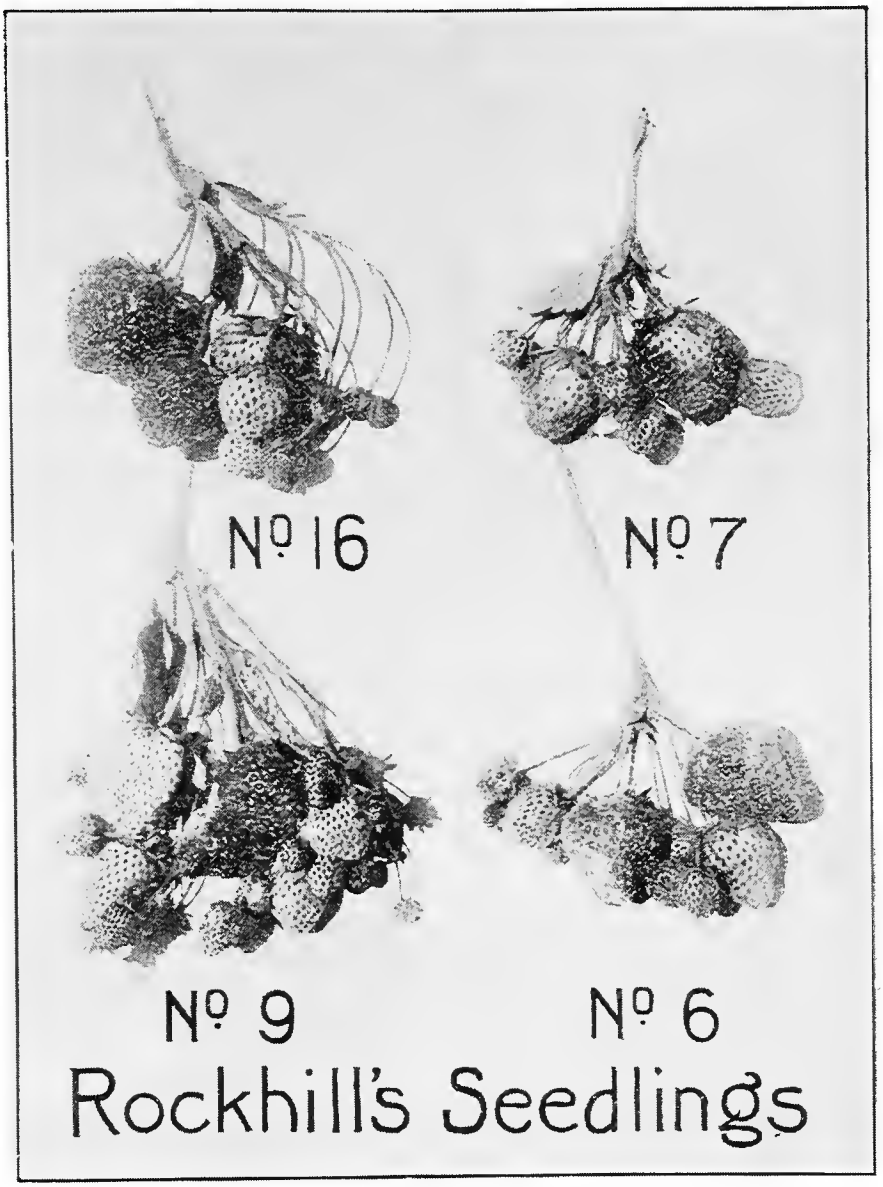
When the canes get long and snaky looking, which will be the latter part of August, these should be gently pressed to the earth and the tip ends covered up so that they will root. The best tool for doing this work is an adz-shaped tool, used in setting strawberry plants; or an old short-handled hoe. A little hole is dug about three inches deep and the end of the cane stuck into the hole so that the tip end will point down. Earth is drawn into the hole, covering the tip and if necessary, a stone put on to help hold down the end of the cane. There is a right time to do this. It must not be done too early or too late. The plants must have time to root and they will never root if frost bitten, before putting in. Black caps can be put down quite early, but there is a particular condition of the cane of the purple raspberry that must be watched to find when is the proper time to put them down. The percentage of good plants will depend upon the condition of the tips before they are put down and the weather afterwards. If the fall is cold, many of the plants will not root nicely. The best conditions exist when the soil is moist and the weather is warm for about 6 weeks after the tips are put in. This is why the quality and size of tip raspberry plants varies so much from year to year. If the young plant is to be taken up, the cane must be severed from the parent plant and the plant lifted out and the earth shaken from its roots with a spading fork.

If these young plants are taken up and set out thickly in rows and grown for another season before final transplanting, they are called one-year-olds or "transplants."

Raspberry plants can be taken up in early spring and heeled or trenched in, closely together and held until June, like strawberry plants with great success. The best looking patch of raspberries we ever grew, was a patch of four acres set from June 10 to 20th and we have set small patches with great success the fore part of July, when the plants had been held in the little beds. One great advantage to this method is that the plants are green and growing when you set them out and they all seem to live and grow with very few vacancies.

All old raspberry canes should be cut out and removed from the hills as soon after fruiting as practicable. These can be snaked through the rows with a horse and tool made with teeth on purpose for this business. The best kind of trimmers are long handled shears. The old canes should be piled and burned. The object of removing the old canes from the patch is to destroy breeding insects and to provide more room for the young canes that are growing for next year's crop, to develop.

There are numerous diseases and insect enemies of the raspberry. The most serious fungous diseases are root gall, anthrac-



Stems of Four Varieties of Fall Bearing Strawberries, photographed Oct., 1911.

nose and red rust. If plants are affected with red rust, they must be dug out and destroyed. The root gall is generally more serious on red raspberries than it is on black or purple varieties, especially the latter. This can be largely held in check by liming the soil and planting only on well drained upland.

Always procure plants as free from disease as possible. Red raspberries are rarely affected with root gall when planted on dry sand or gravel. The disease revels in low, wet, rich soils where lots of animal manures have been applied in years gone by. The disease manifests itself by a sickly, unsatisfactory growth of cane. Dig down to the roots and you find numerous enlargements or tubers on them.

These are the root galls. You can largely avoid root gall by getting only pure plants, using only commercial fertilizers and planting only on dry leachy soil.

Anthracnose is a disease that attacks the canes, and when they are badly affected, you notice small whitish spots all over the cane, especially near the roots. These small spots are about the size of a kernel of wheat bran. These spots are dead, and if they are so numerous that the cane is entirely encircled with them, it will generally wither up and the fruit will stop developing. Sometimes the cane breaks over when the anthracnose nearly envelops it. Bordeaux mixture has been suggested as a remedy for this disease, but is quite expensive to apply and hardly satisfactory. The most practical way is to plant on dry well drained soils and use only healthy plants from a young patch. If anthracnose attacks your raspberry patch, don't use the same land for raspberries for a number of years afterwards. It is best not to set raspberries continuously on the same ground from year to year, but to select new locations. Anthracnose attacks both black and purple raspberries, but I have never been troubled with it on red varieties.

The insect enemies of the raspberry can be generally held in check by poisoning. The cane borer does not generally do much damage except in isolated cases. Generally, clean culture and the right kind of soil, will solve the question of diseases and insect pests, in raspberry culture. The younger and more vigorous the varietv and the better care they have, the cleaner will be the growth and the less they will suffer from diseases and insects.

Raspberries can be kept many years in the same place if well cared for and annually fertilized. We recommend that about 500 lbs. to the acre of high grade fertilizer, analyzing 4 per cent nitrogen, 10 per cent. potash and 10 per cent. phos. acid be applied each year. It can be best applied in the spring, by scattering it between the rows of plants and cultivating in, before growth starts. Black and purple raspberries yield from 2,000 quarts to 10,000 quarts to the acre, depending upon the care they get and the distance apart they are set. I have picked the Columbian raspberry at the rate of 5,000 quarts to the acre at one picking, when the plants were set closely and well cared for.

The most popular red raspberry is the Cuthbert. It ripens midseason to very late and is of the finest quality. The canes are healthy and very vigorous. The Marlboro has been a leading early market sort, but the canes are not very vigorous growers and the variety is being largely superseded by Ruby, which is a more vigorous grower and just about the same kind of fruit. The Loudon is a fine berry of the same general characteristics of Cuthbert but ripens a little earlier. It is more subject to root gall than most red raspberries. Its canes are smooth and of a short stocky growth. Miller is a berry of the wild type that succeeds in the south. The Cuthbert is of better flavor than any of the above mentioned varieties. The Phoenix is a fine fruit of good flavor. The Idaho is a new berry of great hardiness. The canes never get over 3½ feet high and branch naturally. The berries are large and very firm, but not of as good flavor as Cuthbert.

The most popular black raspberries are Kansas, Cumberland and Plum Farmer. The Cumberland is jet black and the others are grayish black. The other black caps largely grown are Black Diamond, Conrath and Gregg.

The most popular purple berries are Columbian, Schaffer, and Cardinal. The Schaffer is the pioneer purple raspberry of great value. Its canes are dark purplish in color and the fruit is soft like red raspberries. The Columbian has light yellow or reddish canes, which grow larger and more vigorous than Schaffers. The fruit is darker than Schaffers and much firmer. It has a large peduncle and the berries do not pick as readily as the Schaffer. The Cardinal has a red cane, is very vigorous and the fruit is very much like Schaffer's. It succeeds best in the West. The Haymaker is a dark-caned variety that makes a great growth the first year and produces a great crop the first year of fruiting, which seems to exhaust it and the growth of cane and crop of fruit is inferior afterwards. The Royal Purple is a dark red caned variety much hardier than any of the others. Its canes are entirely smooth except close to the roots. It is the firmest in fruit of any and can be readily picked and shipped in quart baskets. It is the cleanest, healthiest grower of all purple raspberries.

Blackberries

The blackberry is a fruit that is coming more to the front as a profitable crop to grow. They follow after raspberries and thus prolong the season. Years ago, the woods used to be full of them, and cultivated blackberries had to compete largely with these wild berries. Now these old slashes and wild places are being largely cleaned up, there is no place for the wild berries to grow, and cultivated varieties are more in demand. The blackberry is a very easy crop to grow when once they get well established, and even if the price received is comparatively small, the crop will be found to be quite a profitable one to grow.

The best time to set blackberry plants is when the plants are dormant or nearly so, in early spring or late autumn. The plants are increased from the roots like red raspberries. If little pieces of roots three or four inches in length are dropped in a furrow in early spring and covered with one or two inches of mellow soil, they will grow and make fine plants which are known as root cutting plants. These plants have large roots like grape vines, and must be very carefully set for best results. When the plants are dug from the fruiting beds, between the rows, the plants are called sucker plants. These plants have an upright cane and a horizontal fleshy root. This fleshy root is the life of the blackberry plant and if torn from the cane, the plant is about worthless. The sucker blackberry plant is easier transplanted, and when it has plenty of root, is quite as valuable as root cutting plants.

In setting blackberry plants, furrows should be plowed about 7 to 8 feet apart and 10 inches to 1 foot in depth. Much of the soil will rattle back into the furrow and the plants should be set on top of this loose soil so that the roots, when the furrow is entirely filled, will be about 6 inches below the surface. Like raspberry plants, we prefer to set them from 1 foot to 18 inches apart in the row, thinking that by this method we get fruiting rows much earlier and that they bear better crops, than when the plants are farther apart in the row. The tops need to be nipped back, same as raspberries, to cause the low bushy habit to develop and force more fruit buds to form. The cultivator should be run close to the rows, to save hand labor; and the plants should be dressed out with the hoe to keep them free from weeds. After a good dressing out in early spring of the second year, they will need no more hand hoeing, but all the work can be done with small plow and cultivator. The cultivator must not be run too deep, as every broken root will send up a sucker to interfere with cultivation. The canes that are allowed to grow, must be kept in a narrow row and not allowed to spread over 1 foot wide, for best results. The space under the plants and out as far as to where the cultivator digs, should be mulched with some coarse material free of weed seeds to help conserve moisture and keep down the weeds. The old dead canes should be removed and burned after fruiting time is over. If the canes encroach on the paths in spite of the usual precautions, they can be cut off close to the ground with short bladed scythe or with heavy pruners.

Blackberries need to be fertilized same as other fruits, but one needs to be careful and avoid rich animal manures and any manures too rich in nitrogen. We would use a commercial fertilizer analyzing about 2 per cent. nitrogen, 10 per cent. potash and 10 per cent. phos. acid, using 500 lbs. to the acre every year after the first or second year. It should be applied by scattering over the rows in early spring before cultivating.

The varieties of cultivated blackberries are numerous. Possibly the most popular for cold climates is the Snyder, which is a stocky growing bush and very hardy. It bears an immense crop of berries, round in shape, of good flavor when ripe. The Taylor is a vigorous growing plant with yellowish green canes, while Snyder canes are dark red. It is not quite as hardy as Snyder, but the fruit is of finest quality and long in shape. The Eldorado is a long berry with hardy canes. The Ancient Briton is also a long berry whose canes are very hardy. The Erie is a large round berry with canes almost as hardy as Snyder. The Minnewaska is also very large and round in shape but canes are not as hardy even as Erie. The Kittatinny is a large oblong berry with canes medium hardy. The Blowers is a large round berry, very attractive, but canes are not entirely hardy in Northern N. Y. The Rathburn blackberry is a trailing bush not entirely hardy, but the berries are very large and round in shape. The value of any variety of blackberry for any locality depends largely upon the climate of that locality. In cold climates. the question of hardiness is all important and only hardy kinds like Snyder and Ancient Briton should be planted. In warmer localities the less hardy Blowers ,Erie and Minnewaska may prove more satisfactory, because larger and of finer appearance.

Currants and Gooseberries

I group these two small fruits together because they ripen at the same time and also because they require about the same care. Compared to strawberries, raspberries and blackberries, these fruits are less important, especially for growing for market. While large quantities are consumed, the market for them is more readily glutted than it is for the other small fruits mentioned. I would advise everybody to grow enough of currants and gooseberries for their own use, but before planting largely for market, I would advise that a good reliable market be secured for them.

The currant and gooseberry start growth in spring much earlier than other kinds of berry fruits and they must be transplanted for best success when entirely dormant. For this reason it is not a bad time to set them in late fall and mound earth about each bush to prevent heaving. Whenever they are set, the proper distance to have the rows is 5 or 6 feet apart and the plants about 3 to 5 feet apart in the rows. We have set them as close as 2 feet apart in

the rows, but when they get large and sprawling they crowd too much in the row when set so close. The best plants are those grown from cuttings two years old. Furrows can be plowed where the rows are to come and plants set in the bottom of the furrow so that the earth will reach about two inches above the roots. The plants should be well cultivated and hoed for the first year and after that, most of the work can be done with horse cultivator except, that early every spring, they should have a grubbing out, removing all weeds and grasses. Just a month or so before fruiting time, it is a good plan to sow buckwheat between the rows to cover the ground so that dirt will not spatter on the fruit, and also to act as a carpet to keep down the weeds.

Currants and gooseberries should be watched each spring for the currant worm, which shows first on the gooseberry plants near the roots and works upwards, denuding the foliage of the bush unless destroyed. Hellebore or paris green in water, will dislodge him. About the time the fruit begins to color there will generally be a second brood of the worms, which can be killed by slug shot, hellebore or even paris green, if a rain comes to wash off the latter after it is applied, and before the crop of fruit is picked. Currants ripen in early July and there are generally plenty of rains at this time.

In trimming currants or gooseberries, the main branches should be cut back if they get too long, but generally the most of the pruning should be confined to removing surplus old branches when they get too thick and crowd each other.

Currants and gooseberries, the latter especially, are troubled with a fungous disease called mildew, which causes the leaves and fruit to become diseased and drop off. It is best held in check by liberal sprayings with Bordeaux mixture. If the plants are kept coated with this mixture up to the time the fruit is half grown, it will go through and ripen to perfection. The plants should also be kept sprayed after the fruit is picked, until frosts kill the leaves. It will be found that when sprayed with Bordeaux, the leaves do not fall off early as they usually do, but will remain on the bush until frost kills them; and the fruit buds will be thoroughly developed, and the fruit crop the next year will be larger and of better quality.

After the crop of fruit is gathered, the buckwheat should be turned under and the ground be kept well cultivated until growth stops in the fall. The favorite varieties of currants are Fay's Prolific, Cherry. Versailles and Perfection among red; and White Grape and White Imperial among white varieties.

Among gooseberries the best known red varieties are Houghton, Joselyn and Industry, the latter an English kind. Among white varieties, the Downing, Chautauqua and Keepsake, the latter an English sort, are best known.

The Following Articles Appeared in Farmer's Fruit Farmer A Paper Published by the Author for Four Years

QUESTIONS AND ANSWERS

In 1894 we receievd the following letter from Wilmer Atkinson, Editor of Farm Journal. We were so busy at the time that we could not answer the questions as we would like, and so have concluded to answer them here for the benefit of the readers of Farmer's Fruit Farmer.

Philadelphia, July 13th, 1894.

L. J. Farmer, Pulaski, N. Y.:

Dear Sir:—Do me the favor of answering the following twenty questions in strawberry culture briefly but comprehensively. A large number of strawberry experts will answer the same questions, and a summary of the whole will be sent you when published.

Very truly,

WILMER ATKINSON CO.

1. At what season of the year should the strawberry bed be started?

In the spring as soon as the soil can be properly prepared and the weather will permit. A few plants can be set in July, August and September, but for large commercial purposes, spring is best, April and May and possibly early June, at the far North. At the South, plantings may be begun in November, and as we get further North, the season strings along from November until June, depending on the locality.

2. What kind of soil and location are best?

A soil made up of sand, clay and loam is best for general purposes. Clay soil with northern exposure produces largest, latest berries. Sandy soils sloping to the south produce the earliest berries. Stony loam with hard pan bottom is mostly used in Oswego County, N. Y., and produces the largest crops and holds moisture best, although hard to work. Any soil that will produce a crop of corn will produce a corresponding crop of strawberries.

3. How should the ground be prepared and manured?

We would begin three years before hand and grow corn and potatoes on the land

previous to setting to strawberries, using lots of barn manure on the two crops of corn and plenty of commercial fertilizers, rich in potash, on the potatoes. The ground should be plowed several times in the spring previous to setting the strawberries, and harrowed until as fine as an ash heap for best results. We dig as deep as possible early in the season, and for a week or over before setting the plants would merely go over the surface with a weeder, stirring the soil but one inch deep.

leaves plenty of space between the plants and they will all develop to grand proportions and bear great crops, whereas, if all runners were allowed to grow, the plants' vitality would be weakened by the excessive runner production. If this plan is properly carried out there will be about nine to ten inches between each plant at fruiting time and this space is ample.

5. How do you take up plants for setting?

We used to take up a lot of plants and

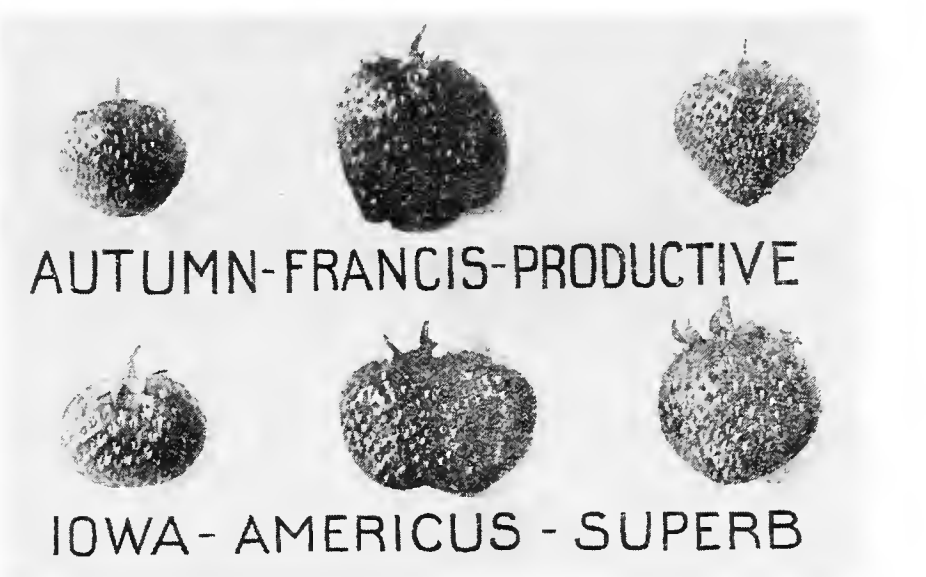


Plate showing Comparative Size and Shape of Six Varieties of Fall Bearing Strawberries, Much Reduced, photographed Oct., 1911.

4. How far apart should the rows and plants be set and how thick should the plants be at picking time?

I used to favor setting rows five feet apart and plants one foot apart in the row. We still practice this method when growing for plants and fruit on the same ground. We dig up all the new plants and leave the old plant, set the year before, in the ground to fruit. A better plan is to set the rows so as to cultivate both ways early in the season, and, as the runners start, go but one way. If one sets the plants two and one-half by three and one-half, you can cultivate both ways until the middle of July, thus saving lots of hand hoeing. About this time allow four runners to start from each plant and layer the young plants between the old ones, filling up the vacant space. Keep off all other runners and cultivate one way. This

carry them to the woodshed, where the women folks picked them over, cutting off the surplus leaves and shortening the roots to about five inches. We now take the plants up in early spring as before, but instead of setting them out directly in the field after picking over, we heal them in together in little beds and keep them there until about June 1st, watering them and spraying them with Bordeaux mixture meanwhile, and when ready to finally transplant, we take up with earth adhering to the roots and place in pans, watering the roots. We find that this early transplanting hardens off the plants, and when they are set out in the fields, June 1st, they suffer no set back, but grow and thrive right along. In digging the plants in the field, we use a spading fork and get most all the roots. We hustle them from the sun under cover as soon as they

can be moved, burying roots under the earth as fast as each bunch is tied up.

6. Tell the advantages of mulching, underdraining and irrigation.

Mulching keeps the plants from the effects of changes in heat and cold. It is not used as a warmer for the plants, but to shelter them from the rapid alternate changes in the weather of late fall and early spring. It also tends to kill many weeds that start in spring before the mulch is removed. It retards the time of ripening when not removed early in the spring. A summer mulch between the rows and around the plants tends to keep the berries clean, the soil moist and the berries from drying up or ripening all in a heap. It makes the soil richer for succeeding crops. Underdraining makes the soil in better condition for working; the roots of the plants penetrate deeper and stand drouths better; it sweetens the soil and brings into availability much locked up fertility; it prevents the plants from becoming covered with water in winter and consequent winterkilling by smothering as well as heaving. Irrigation tends to carry the crop over severe drouths, enabling the plants to produce maximum crops by supplying an abundance of water at the right time, which is often of the greatest importance. We may give the best of care and sometimes in the severest drouths, the crop will fail from lack of water alone. Thorough underdrainage and mulching are the simplest and most effective methods of practical irrigating. An irrigating plant is of no use unless it supplies water at just the right time, the dryest season; and there are few such plants that do not fail in the dryest seasons.

7. Name five of the most valuable varieties for market.

I should name for Oswego County, N. Y., the following five varieties as best for our purpose: Rough Rider, Ridgway, Sample, Seaford and Clyde.

Name five others that are best, with points of excellence of each.

Glen Mary, Barton, Edgar Queen, Lady Rusk and Ruby. Rough Rider is of a large, rich, dark color, very firm, best of keepers and extremely late, as well as productive. The plants are healthy. Ridgway is medium in size, very regular in shape and beautiful. Enormously productive and best in quality. Sample is perfect in growth, berries are very large, good shape and produced in immense quantities. It is pistillate and must be planted beside Rough Rider or Ridgway. Seaford is early to medium, large, good, rich, dark color, good shipper and best for canning. It must be pollenated by Clyde or some other perfect flowered variety. Clyde is early medium, immense in size and productiveness, not very rich in color or very firm, but sells well in nearby market. Glen Mary bears alone and is very large, firm and immensely productive, but sometimes rusts, as it did with Mr. Learned last year, when Rough Rider was perfect in foliage. Barton is large, long in shape and immensely productive when planted near Clyde as a pollenator. Edgar Queen is immense in size and productiveness, bright colored and ripens in midseason to late; plant it beside Ruby. Lady Rusk is medium in size, of very dark color, firm and a good keeper; you can keep Lady Rusk a week. Ruby is very large, irregular in shape and productive. It is a good pollenator to plant beside Lady Rusk, Seaford, Edgar Queen and other pistillates.

8. Name five best for the garden or family use, with points of excellence.

Ridgway, very late, splendid flavor, productive. Earliest, very early and of splendid flavor. Atlantic, spicy flavor, good color and late, desirable for home use or market, splendid to can. Marshall, early, large and fine flavored. Maximus, very large, fine flavored, productive.

9. Do the above approved varieties require the same culture, or is it best to vary culture to suit the variety?

They will all do well if the plants are set as indicated, 2½ by 3½, and the runners all kept off but four to each plant. Some of these varieties will not do their best if grown in thick, matted rows.

10. Name faults of other varieties you have tried and discarded

The list is too numerous to mention. In recent times, the Warfield was surpassed by the Seaford, and so we dropped the Warfield for commercial purposes. The Haverland was surpassed by the Barton. The Bubach was surpassed by the Clyde. The Brandywine and Gaudy, especially the latter, is superseded by the Rough Rider. The Timbrell and Hunn, while very late, are subject to weak foliage. The Crescent is too small, as is the Wilson. The Pennell is no better than hundreds of others that have been in cultivation for years. The Parker Earle is unable to develop all the berries it sets. The Carrie is too soft and light colored after extensive trial. The Bismark is too light colored and has not calyx enough to make a pretty berry.

11. What will prevent or cure leaf rust and how do you deal with insect enemies?

Leaf blight is carried from the beds, where the plants are taken up from, to the new beds on the plants when they are set out. If, when they are temporarily set in the little beds, we spray them with Bordeaux for several times, we kill the fungus; and if no strawberries have been grown on the new piece before, we are less liable to have the leaf blight. It is best not to grow strawberries on the same

piece year after year. But if one is compelled to do this, he must fertilize more heavily and spray with Bordeaux before and after fruiting each year, at intervals of not over three weeks apart. The mildew troubles more than leaf blight in Oswego County and is controlled the same way.

We practically get rid of the white grub, which is the only insect of much consequence to trouble strawberries, by cultivating the soil in hoed crops three years before setting out plants. It takes three years from the time the May bug lays its eggs before it is a May bug again, and, as these beetles do not favor cultivated soil for laying their eggs, we thus avoid them.

We also find that these beetles are much more liable to lay their eggs in the vicinity of maple and other trees than in the open country. There are a number of insects that trouble the strawberry plant in New Jersey, Maryland and other warmer climates that have not yet got a foothold in the section where we live. Among these are the root louse, crown borer, etc., etc.

12. Why do varieties run out?

Varieties run out by practicing cultivation different than the cultivation and conditions that existed at the time the variety was discovered. If the variety was originated under the most favorable auspices, it will deteriorate under partial neglect and finally refuse to respond. If a variety was originated under neglect, it will show great results for a time under stimulating culture, but after a time it sports and runs away from itself and is not the same variety. A variety in order to keep always good, must have the same culture and environments that it had when it was first cultivated or originated, and this is practically impossible to give. A variety also deteriorates by the selection of plants. If the weak puny plants are set from year to year, poor results will show sooner or later. If a variety is rushed to get new plants, stimulated by highly nitrogenous manures, it will deteriorate in its fruiting capacity. In order to keep a variety good as long as possible, I should grow it in matted rows for plants and set the average sized plants from year to year and never allow the plants that I wished to propagate from to bear fruit. You can develop most anything you wish by a proper selection of plants. If we select the plants that run to runners more than others, we develop the running habit, while, if we select the plants that run but little, and keep the practice up from year to year, the variety will soon develop to a practical bush form.

13. How many bushels have you grown to the acre?

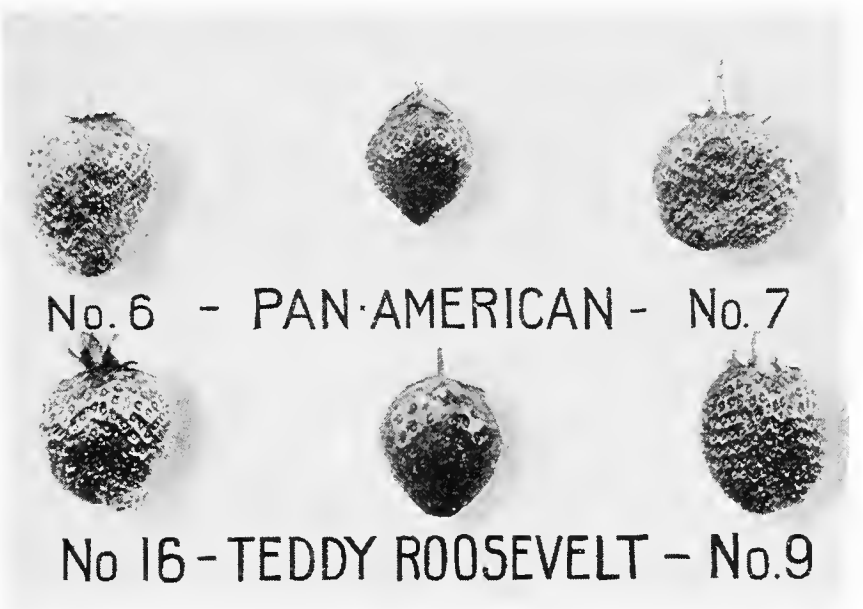


Plate showing Comparative Size and Shape of Six Varieties of Fall Bearing Strawberries. Much Reduced, photographed Oct., 1911.

We have produced at the rate of over 500 bushels to the acre of Crescents and 412 bushels of Parker Earle to the acre. These were in patches of one-sixth acres. I should think that a strawberry grower ought to average 4,000 quarts to the acre.

14. Give method of treating a bed after bearing for the next or second year's fruiting.

We usually mow off the weeds, if there be any, and the tops of the strawberry plants, then remove the litter and cultivate the rows close up to the plants, pulling out the remaining weeds by hand. Some use a smoothing harrow after plowing two furrows between each row, across and lengthwise, and finishing with hand weeding. Others burn over the patch after mowing, shaking up the mulch so it will burn readily, and then cultivating between the rows. Plenty of fertilizer should be applied to the plants after either of these methods that they may start readily and make a good growth by fall.

15. Give experience with layer and potted plants and fall setting.

In the layer plants the roots grow naturally in the soil. They ramify in all directions in search of fertility and moisture. The plant gets large and, if carefully taken up, it is at its best. The potted plant is confined to the little pot and the roots run round and round the pot in search of something they never get, become so entangled that they never get untagled, and the plant will not as a rule, do as well as the layer plant if carefully handled. Potted plants have the advantage that careless people can handle them and get small results, whereas it takes a man with a head to get the best results from common plants, even if the nurseryman has done his part well. They must be kept from the sun and planted in the shady part of the day, watered and shaded for several days after planting. Especially is this true if the weather be hot and dry.

16. Give suggestions on picking and marketing.

Strawberries should be picked in the cool of the day, if possible, and placed upon the market as soon as possible. Pick before fully ripe if to ship to distant market. Strawberries for home use and nearby market may be allowed to ripen fully before picking. Pick with a half-inch stem and do not touch the berry itself in picking. Pinch off the stem, and handle by the stem and place carefully in basket. Put berries in the basket as they come, level off the tops so they will look nice and fit in the crate without bruising. If the grocery man or commission man can handle them, let him do it. Your time is worth more at home attending to the details than it is on the road. A small boy can be sent to market with the loads of berries. Use clean baskets and crates, mark your name on them, have the horse and wagon look neat and tidy, also the driver. Do not disappoint your customers.

17. How best to save hand hoeing in strawberry culture and do most of the work by horse power? What special tools do you recommend?

The best way to save hand hoeing is to set the plants in absolutely straight rows and at regular distance in the rows, so that the cultivator may be run up close to the plants and both ways in the rows. Hoe the plants before the weeds are of an appreciable size, and thus save lots of work. Layer but four runners from each plant; cut off all the others and you have a systematic row which anybody can soon learn how to hoe readily. We recommend for setting plants an adz-shaped tool used in Oswego County. I have had men set 5,000 plants per day with this tool. I recommend a cultivator with narrow teeth, so you can get close to the row without throwing earth onto the plants. I recommend a weeder that will shut together, so that it can be run between the rows and almost right onto the plants for some time after they are set.

18. Would it be best to discard imperfect-flowering varieties and plant only staminates; if both kinds are planted, what proportion should be staminate?

I do not think it would be wise to discard pistillate varieties, although there are more valuable staminate varieties in cultivation now than there was ten years ago. I should very much dislike to give up the Sample, Seaford, Edgar Queen, and several others. A staminate or perfect flowered variety will do better than a pistillate in a wet time, or rather when the season of fertilizing or pollenating is wet. Bees and winds do not operate to carry the pollen from the perfect flower to the pistillate at this time. However, a pistillate flower will stand more cold and freezing weather than a perfect flower. When it rains in blossoming time, the pistillates are liable to be irregular in shape. If it freezes in blossoming time, more of the perfect flowered varieties will be blasted than of the pistillates. I think in planting, that half of the plants should be perfect and half imperfect; and for the best results, it is better to mix the plants in the rows, keeping several rows for propagating purposes, unmixed.

19. Give a list of "dont's" in strawberry culture.

Don't go into the strawberry business on a too big scale at the start. Don't know less about it than your hired man. Don't set on poor soil. Don't set on partially prepared soil. Don't take plants from a neighbor's old bed, even as a gift. Don't

buy the tree strawberry humbugs. Don't let the weeds get as high as your head before hoeing. Don't have a horse to cultivate, that steps wide. Don't use an old, out-of-date plow or cultivator. Don't spend all summer in caring for your beds, and then neglect to cover them in early winter. Don't let the mouse-eared chick weed get the start of you in early spring.

Don't set plants on a piece that you know is laid full of May Bugs' eggs. Don't pick the berries in the heat of the day. Get

Yes, they had; and we think that in the last few years that almost every one has had more than they ever did before. Beginning with hot house strawberries in December, we follow along with berries from Florida, Georgia, South Carolina, North Carolina, Virginia, Maryland and Delaware, New Jersey and New York State and finally winding up with berries from Nova Scotia. We received a can of fresh strawberries November 1st. These were grown in Cattaraugus County, N. Y. We

L. J. Farmer's Children Arranging and Crating the Full Strawberries, photographed Oct. 20, 1910.

enough pickers on to have them all picked by noon if possible. Don't allow the crates of ripe berries to stand in the sun. Don't hire untrustworthy pickers. Don't scrimp on your measure. Don't mix the berries in the baskets. Don't put Crescents in the bottom of your crates and Marshalls on top. Don't send your fruit to one commission merchant one day and to another the next. Don't send to commission merchants that have no commercial rating. Don't send to a glutted market, what you could sell at home. If you have a big yield any particular year, don't spend half your time in telling your neighbors about it. It has a two-fold effect: The neighbors go to setting strawberries, and your patch is liable not to do as well next year. Don't think that because a variety does well for a term of years, that it will always be the best variety for you.

20. Ought everybody to have all the strawberries they want?

think that in a few years it will be possible for the rich to buy strawberries every week in the year. The farmer can have on his own table quite a long time, strawberries finer in flavor than the rich can possibly buy in the markets. Most everybody can have strawberries now for several months at comparatively small cost. The southern berries are sold in local northern markets almost as cheaply as the home grown product, for weeks before our berries ripen. I believe there are more berries grown in the south and shipped into our local market and consumed before our berries ripen, than the home product will amount to. The strawberry business is of greater importance than most people are aware of. It has been estimated that there were $80,000,0000.00 worth of strawberries grown and consumed in the United States during the season of 1900. The possibilities of the strawberry are not fully realized yet.

L. J. F.

Wintering Strawberries

There is a certain amount of work that is quite necessary to be done to prepare strawberries for passing through the winter. Especially is this true if the previous culture has been partially neglected, the soil heavy or not sufficiently drained already.

On upland naturally drained or thoroughly underdrained artificially there is no necessity for providing surface drainage. This matter will take care of itself on such soils. But on low, wet soils this surface drainage is all important to insure the plants going through the winter without heaving out. If water stands around the plants and freezes again and again, it will heave the plants and destroy them. On low land it is a good plan to gradually work the row of plants up on a slight ridge through the growing season by hauling up earth around the plants in September, to smother the small weeds and insure the runners rooting readily. By fall the rows will be much higher than natural, and there will be depressions between the rows where the water will settle.

About November 1st it is a good plan to run the double-mouldboard plow between the rows, to still further deepen the ditches between them. The loose soil thrown out by the plow will settle about the young plants and help them through the winter, as well as form a ridge on each side of the matted row of plants. All water will settle in the ditch, and the row of plants will be up high and dry.

We cover strawberry plants in winter, not to keep them warm, but to prevent the too sudden changes from heat to cold that would occur were the plants left bare. It is not so necessary to cover thickly matted rows as it is rows where the plants are few and scattering. If the foliage covers the ground it acts largely as a mulch of itself. The continued alternate freezing and thawing is destructive to strawberry plants. When soil freezes, it expands and lifts the rows of plants up a little. When it thaws again the earth settles back, but not so the plants; they stay up on top; the roots become bare, are frozen and die from drying. If a mulch of coarse material is placed on the rows of plants it tends to force the plants back when the earth thaws. Then, too, a heavy mulch on the surface prevents too sudden thawing or freezing. I have known plants to start and blossom during warm spells in the winter when not mulched. Of course, this would much impair their vitality and affect the future crop of berries.

The time to apply mulching material to strawberries is in the late fall as soon as the ground is frozen quite hard. The usual time in Northern New York is about December 1st. It is better to apply the mulch before the severest freezes, provided you can get onto the ground readily. As the fields are generally large and the time that will admit of doing the work is quite limited, we generally wait until the ground is frozen hard enough to bear a loaded wagon, and then drive anywhere, depositing the mulch where wanted.

The best material to cover strawberries is that which you can get the most readily, and costs the least. Coarse straw, comparatively free of weed seeds, is generally used. A few growers are lucky enough to live near marshes, and get cut hay for covering. This makes an ideal mulch. We use all the horse manure we can get at $1.00 per load in town. Draw it during the summer, and fork it over several times to get uniformity and kill weeds. We think that the manure is one of the best mulches, as it serves two purposes—mulch and fertilizer. We use lots of buckwheat straw, and find it a good thing. It has been our custom to buy odd lots of old straw, as well as buckwheat straw, that we could get at a bargain, and thus we have saved much. It is quite expensive to cover strawberries with marketable straw worth $6.00 to $8.00 per ton, as it takes about three tons to the acre.

It should be put on about three inches deep when it is first applied. This, with the rains and snows, will pack it down to an inch or less. Our rule is to cover so as to just hide the plants from view. Where the field is entirely level it is best to cover the entire surface with straw; but when the rows have been ridged up for winter and ditches left between the rows it is best not to put straw in the ditch, but to just cover the row of plants, leaving the ridge of earth thrown up by the plow as an outside border for the straw. This leaves the ditch open, and the water will then pass off, should thaws come in the winter and spring.

There is no definite rule to give, when to take off the straw in spring. As soon as well-settled weather comes we rake it off and place between the rows as a summer mulch. It should not be taken off before the ground stops freezing, nor should you wait too late. I have known some early kinds to smother by having the straw kept on them too late. I do not know but this is a good rule: Take the straw off as soon as the plants start to grow.—L. J. F. in N. Y. Tribune-Farmer.

Where's Plum

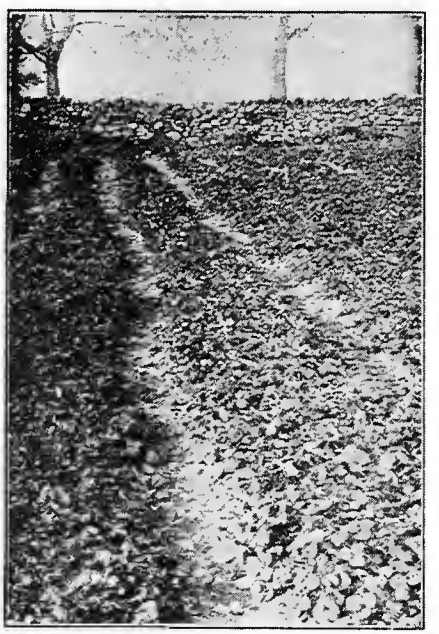
The following short article appeared in the July, 1899, issue of Farmer's Fruit Farmer. It has caused so much comment, that we reprint it here:

'We are one of those blessed (?) with having a nickname, or baby name that has

clung to us from childhood, and which will always cling to us. In Oswego county and among our friends we are known as "Plum Farmer.' This is an abbreviation of "Sugar Plum," a baby name given us by our father. Most nicknames slump away from a person when they grow up, but this has grown up with us and is around and beaming upon us every day. We remember the friends of youth. They were known as Mung, Wheat, Wormy, Bub, Mug, Deacon, Duvii, Schrack, etc., etc.,

For seventeen years we have been in the berry and plant business. For seventeen years continuously from spring until autumn, we have heard the question, "Where's Plum?" We hear it in the early morning under our window before we are up, asked by someone who wants plants, somebody who wants to know where to go to work, or some berry picker who wants to know which row to take. We hear it throughout the day, asked by those who wish to know the where and how,

PAN AMERICAN



FRANCIS & AMERICUS

Showing Comparative Growth of Pan American and Francis & Americus, under the same Conditions. Photographed Oct. 20, 1910.

but these have all been dropped when the boys went to college or grew up as men. We never went to college, that great institution which enables a man to forget all the small things of life and which puts upon him a sudden dignity. We have never made any particular effort to part with the name. In fact we had no other name until ten years old, when we named ourself Lawrence Jones. People prefer the baby name, else they would not use it and so let them have it. It has a peculiar resonance and balance enjoyed by few other names. We are often amused to see how early the kids catch on to it. We have heard little kids just beginning to walk call out "Hello Plum" when we pass by. We kind of like the name ourself.

about the thousand and one things that must be done upon a fruit farm. We hear it after dark, when some night hawk comes after plants, etc., when an animal gets out of the lot, a horse is cast or somebody is sick. We often wonder if we shall hear it after we are dead."

The Variety Question

The most important point of all in strawberry culture is the variety question. Yet it is the least understood thoroughly, and therefore more mistakes are made in this line than in any other. Take the subject of sex in the blossoms. Very few understand that there is such a thing as sex in plants anyway. These people expect to raise strawberries, no matter what kind of plants they set out. They go to

old beds to get a supply of plants, because they can get them for the digging. If several kinds have been planted there and some of them are pistillates or imperfect in blossom, they are just as liable to get the imperfect blossomed kinds, with the result when the plants fruit, of gathering only nubbins or no berries at all. When the old Wilson and Crescent used to be planted together so extensively, the Crescent would outrun the Wilson and an inexperienced person digging plants from such a bed, would almost always get Crescent plants because of their better appearance. There have been thousands of unfruitful strawberry patches in this country because of this fact alone.

Then there are varieties adapted to low lands and others adapted to uplands. There are a few that will do well in either place. As a rule a plant that runs wild like the Crescent will do better on up land, while varieties that make large plants and fewer of them, do best on low lands. There are many exceptions, however, to this rule. I wish to state here that no land will produce good strawberries when water stands upon it any length of time. If the land is naturally wet, it must be thrown up in beds and arranged so that it will drain off quickly after a heavy rain. I have found the Ridgeway, Enormous, Edgar Queen, Atlantic, Earliest, Star, Sample, Margaret Carrie and Wilson doing as well or better on low ground, while the Clyde, Barton, Seaford, Splendid, Lady Rusk and many others seem to do best on uplands

There are so many large, fine appearing, firm berries now in cultivation that it seems a pity the markets are so loaded down with inferior varieties that are no better producers, while they are so decidedly off in appearance that people do not want them at any price when they can get the better kinds.

How to Prolong the Strawberry Season

The strawberry season may be made to last several weeks by a little forethought and preparation. Sandy soils produce earlier berries than clay, and southern slopes earlier than northern exposures. Mulched berries ripen later than those unmulched. If one has sandy soils to deal with, he may retard the season of ripening by applying straw to the bed for late berries, leaving the other part uncovered for an early crop. If the soil be clay, it should alwavs be given winter protection to prevent heaving of the plants by alternate freezing and thawing in spring. The part designed for early fruit may have the straw removed early, substituting a mulch of horse manure, which, on account of its warm nature, hastens the time of ripening. For late berries the part still covered with straw should have the mulch shaken up so as to prevent the ground from souring, and to allow the plants to grow through. If one has both kinds of soil, he can still further prolong the season. For a crop of first early berries, plant on light sandy soil sloping to the south, with no mulch. For the latest fruit, plant on moist, heavy clay sloping to the north, with a three-inch mulch of straw. Treated thus, the strawberry season may sometimes be prolonged to six weeks.

THE NEW STRAWBERRY CULTURE

How the Work is Done and Some of the Advantages

(Extracts from an address given by L. J. Farmer before the Western New York Horticultural Society, Connecticut Pomological Society, New Jersey Horticultural Society, Michigan Horticultural Society, and the Provincial Society of Quebec, Canada.)

When we speak of the New Strawberry Culture we refer to the method of taking plants up early in the spring and trenching them in temporarily before transplanting permanently to the open fields. I hit upon this plan through my endeavors to save plants of new varieties that had come early in the season from other localities—too early for planting in this section. We used to pack them in moss and keep them down cellar and in other places, but the percentage of loss was great, no matter what other method we employed.

When we get plants from southern sections now, which is often necessary with new varieties, we bury box, plants, moss and all, without unpacking, in a deep snow drift, digging way down to the bottom, replacing the snow and covering well up with straw so that the snow won't melt readily as the warm weather comes on. This was our practice with the 10,000 each of Michel's Early, VanDeman and Lady Thompson, all of which came originally from the far south. Had they been ordered and shipped to us at the proper time for planting in this locality, they would have been loaded with fruit, been enfeebled, and nearly all would have died. When the snow melts so that it does not keep them, we remove from the straw, open packages, and trench the plants in where wanted.

What was formerly our practice with only a few plants that came from a distance has now become our general practice with nearly all the plants we set out for fruiting and propagating purposes.

How Trenching is Done

The tools necessary are a spade or shovel, a hoe or garden rake, and a pair of shears. With the spade we open a furrow about eight inches deep, as one would with a light, one-horse plow. For best results the soil ought to be previously well fitted, either with plow and harrow or by spade and rake. It should work easily. Cut off all leaves and rubbish, leaving only the short green leaves, shorten the roots to four inches. Open the bunches and spread out the roots. Take a small handful of the plants and place them in the trench, up against the perpendicular side, close together, but only one plant in a place so all the roots will reach the moist soil. When the trench is full, haul earth into it, filling it up level. Afterwards tramp the soil down onto the roots, haul on more loose soil, and proceed with the next trench. By this method about 10,000 plants are heeled in on a square rod of ground. It is our practice to have three of these little rows close together, six or eight inches apart, then skip a row for a path to enable one to get around among them for watering. When trenching is completed, we fill in between the rows and around the plants with fine straw or rotted manure to conserve the moisture. The plants are now given a thorough soaking, which operation is repeated as often as they show any signs of wilting.

In order to make the plants perfectly healthy and free from leaf blight or mildew, before they go to the permanent field, we spray them with Bordeaux mixture about once a week as long as they remain in the little beds. For best results this trenching should be done as early in the spring as possible, about the time that is best to set the plants cut by the old method. When the blossoms appear they should be cut off. The plants will not make the rank growth in these beds that they would if left in the old bed, but will grow stout and stocky, making short, stubby leaves. When taken up for final transplanting, new roots have started, earth clings to the roots and they grow right along, receiving no check.

While the plants are resting in this little bed, the field where they are to be set finally upon is receiving the best of attention. It is plowed, harrowed, plowed and harrowed again, till mellow as an ash heap. When thoroughly broken up and tilled, it is allowed to rest, save an occasional dressing with the smoothing harrow. This tool is run over the piece every other day to stir the surface and prevent evaporation of the moisture from below. When the plants are ready to set, about June 1st, the piece is mellow as an ash heap and the soil moist just below the dust mulch made by the weeder.

The piece is marked, the plants are taken up in pans, with the earth clinging to the roots, wet and set out. The further cultivation is the same as where the plants are set by the old methods.

Two Plants of the "Productive" Fall Strawberry in Fruit. Photographed 1910.

The Advantages

The advantages of this system will recur to anyone familiar with strawberry culture. We all know that the most expen-

sive time in the life of a strawberry bed is the first few weeks after they are set out. The weeds are up and growing, but the plant does not seem to start promptly. Eternal vigilance is the price of a good stand of plants the first year. By this method, we save this early hoeing and weeding, the weeds are killed by the constant hetcheling before the plants are set out.

On soils that are tenacious, have clay in their make up—and these produce the best crops of strawberries—it is impossible to fit properly strawberry land early in the spring, early as we would like to set the plants, because they should be handled just as they start to grow. By this plan we have all the leisure possible and there can be no excuse for not fitting the soil to perfection. The matter of spraying is a subject that is receiving great attention. We find that the reason our fields have been unfruitful in many instances was on account of the blight and mildew. It is necessary to spray, and ten thousand plants can be sprayed somewhat more economically when clustered in a small space than when spread over an acre or more. It saves time and Bordeaux mixture. An item that will be appreciated by farmers who have spring work rushing them, is the fact that they can have the plants come from the nursery at the proper time, trench them in securely in a very few moments and then, when the rush is over, say about the first of June, set them out where they want them.

June 1st in this locality is the proper time to finally transplant them in the permanent field. Everything is on the go June 1st—the weather is right, the soil warm and everything grows when put into the soil. You plant corn then, you set out tomatoes and sow all the tender vegetable seeds then, and why not set out your strawberry plants then? We do, and we hope our friends will try our plan this year, even if only on a limited scale. We have practiced this for years.

What is a Good Day's Work?

Few men who hire help or work for others understand what a fair day's work is. This is a point that should be better understood.

When I hire a new man I prefer to work alongside him for a few days to find out his mettle and get a gait on him, rather than to let the other men establish his gait. The first few days a man is with you are important ones and determine his future usefulness. If he works with you these days he learns to like you. You show him, not only how to do the work, but the why of it. If he works with the other hired help and you are not around, they exert a bad influence over him. Hired men are always jealous of newcomers. They seem to think that a new man coming on lessens their chances of staying their time out, and so their heads go together to concoct some scheme to get rid of the new man. Little petty grievances of the men and the drawbacks of the employer are magnified and pointed out to the newcomer so forcefully that he refuses to stay in such a hard place.

Put a lot of men that have been hired indiscriminately into a field to work by themselves, and they won't do half as much as if you were with them. It always pays to have a manager, and, if you cannot be with them yourself, it will pay to get a competent man as foreman.

I have had men who could get more work out of others than I could myself. But good foremen are scarce.

I find that it pays to hire by the piece when possible. The men do more, earn more and are better satisfied, because in reality they are working for themselves. They do the work quite as well, too. Of course, in hiring, it should be stipulated in the bargain that the work must be done well.

In gauging the work a man ought to do in a day, I go by the amount I can accomplish myself. Some men can do more, the majority less. Commencing in early spring we pay twenty-five cents a thousand for digging and tying into bunches strawberry plants. I can put up five thousand a day without worrying. It is worth thirty cents to handle large plants and twenty cents for smaller kinds. After the plants have been forked out, an active man or woman can shake out, bunch and tie ten thousand plants in a day. I have done this myself. I pay fifteen cents a thousand for doing this. A man ought to dig and tie into bunches two thousand to twenty-five hundred black cap plants in a day. For this work we pay fifty cents a thousand. We pay the same for digging and tying red raspberry sucker plants. On loose soil it is worth seventy-five cents a thousand to dig and bunch blackberry plants. On stony soil we pay twenty-five cents a thousand more. I have dug, but not bunched, two thousand blackberry plants in a day. You can readily see that better wages are paid for handling strawberry plants than other., but this is because they must be handled more carefully and at a season when labor is in great demand—the planting season. We aim to get our raspberry and blackberry plants dug late in the fall or very early in the spring, when labor is more plentiful.

In digging strawberries it is a good plan to have one man dig and two or three pick up the plants. On stony soil we use a

spading fork for digging. On loose sandy or loamy soil most people use a potato hook. We use a spading fork for digging all other plants.

We pay fifty cents a thousand for setting strawberry plants. An ordinary man will set two thousand or so in a day. I could not set over twenty-five hundred myself in a day, but I have had men who could set five thousand a day, and it was done well. They were trained to the business. When we set raspberries, blackberries or currants, all hands go at it. We wish to get them in soon after digging. The land is furrowed out all ready for planting. This season, in setting black raspberries, we worked this wise: One man dug the plants and two shook them out and cut back the tops. Two others carried to the field and dropped them for two men who set them. One man was dropping all the time, while his partner was after plants. In this way we accomplish more than when one man does all the different parts himself. It ought to be worth fifty cents to $1 a thousand to set raspberries after the plants are dug and the ground furrowed ready to receive them. It largely depends upon the distance you set them apart in the row. We set one foot apart.

We pay one and one-half cents a quart for picking strawberries. A good picker can average $1 a day. It is worth twenty-five per cent. more to pick raspberries, blackberries, currants and gooseberries.—L. J. Farmer in New York Tribune Farmer.

Covering Strawberry Plants With Earth

Straw and other mulching material is very scarce this season on account of the unprecedented drouth of the past summer. Every farmer needs all the oat and other straw raised this summer, for feeding and bedding. It has been practically impossible for us to procure enough material to cover our large fields of strawberries, so we are going to resort to an experiment on a large scale. We are going to cover the vines with earth from between the rows. We call it an experiment, although we have demonstrated the feasibility of it in the years gone by, but of course, on a much smaller scale. In plowing ditches between the rows on low ground, there will always some of the earth rattle onto the plants and cover them. These have always wintered finely. We have tried covering the old plants and late fall-set plants with two inches of earth for several years and have always had them winter to perfection. Sometimes, when we have covered a few plants as an experiment, we have forgotten to uncover them in the spring. and later found that they had grown up through the two inches of mulch, and bore a full crop. It is an experiment with us this year only in the magnitude of it.

Most of our plants this year are on low clay soil. Those that are on upland are of the Rough Rider, Kansas and other new varieties, grown for plants to reset and sell, and we will cover them with straw so as to be able to dig early in the spring. Those on the low ground are set five feet apart and have made rather narrow rows.

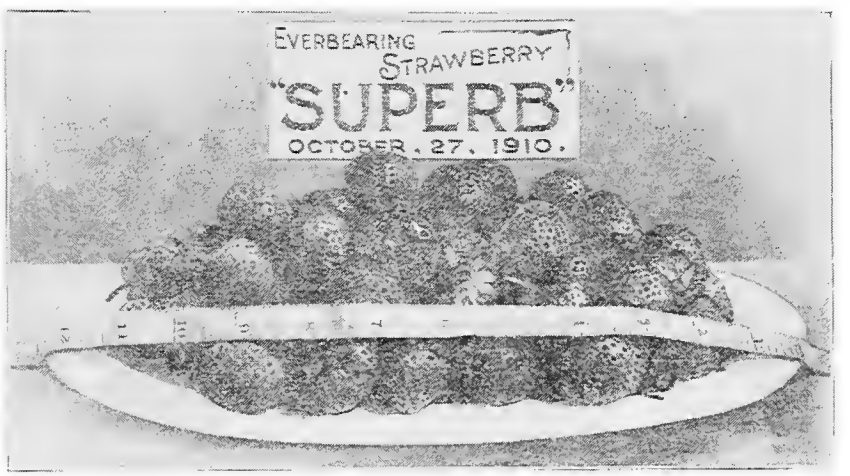


Plate of Superb Strawberries Photographed Oct. 27, 1910.

We shall go through the rows with a small-one-horse plow, cut a narrow furrow quite deep, turning it right onto the plants. By going twice in the same row, down and back, both sides of the plants are covered with earth. It is now November 16th, and we have already done part of this work, and will finish as soon as the weather will permit. Any time after growing weather is over, and before the ground freezes hard, say from November 15th to December 1st, in this locality, will do. In milder climates the time might be prolonged till December. I would not cover them with earth in any locality where there was a liability of being much growing weather in winter; better not cover them at all. The ditch made by the plow drains the row of plants perfectly, and they stay right in place, and, if uncovered early enough in spring, will be found to have wintered finely. They should be uncovered as early as possible in view of the freezing weather and hot spells that come on in early spring. About the middle of April is the proper time. To uncover our large fields, we expect to use a weeder, going over the rows and stirring the ground, breaking the crust so the plants will grow through. If this does not work to perfection, we will proceed as if our beds were small, using a hoe or back of a garden rake to get the thickest off. It must be remembered that plants will grow up through a half-inch or more of earth and be better for it.

The Fellow Who Kills the Market

There is one nuisance that the legitimate fruit grower, the man who makes fruit growing a business, will always have to put up with, and that is the demoralizing effects of peddling by the little fellows, men who do not make a business of fruit growing and who have no interest in the business as a business.

A farmer will plant a few hundred strawberries, and, if the season is good and they do well, he will, in the height of the season, when the picking is the best, have a crate or two that the family cannot use. He goes to a business fruit grower and borrows some baskets and a crate, picks his berries and takes them to town. Well, everybody else is picking at their best, and the markets are full. If the grocer won't offer him more than the berries are selling for at the time, he starts on a rampage to sell those berries and he soon finds that most everybody has enough berries for the day, and so he cuts the price, and the farther he goes the worse he cuts the price. He is mad at the groceryman and at fruit growing and fruit growers in general and, saying that he don't care a darn, he don't get his money out of berries anyway, he does more to demoralize the market with that one crate of berries than 50 crates would if in the hands of a man who understood his business. I have known strawberries early in the season here in Pulaski to be selling at retail for 14c per quart, when the grocer would gladly pay 12c wholesale for them, and some fool farmer would drive in from some adjoining town where the soil was sandy and thereby earlier, and, regardless of season and the price, offer them at 6c per quart. I never blame people for getting things as cheap as they can, and, of course, if berries are sold for 6 cents, this makes the price, to a certain extent, and in this particular instance, strawberries dropped from 14 cents one day to 6 cents the next and held there the balance of the season. Had the product been wisely handled, the market might have held to 12, 10 and 8 cents for a week. The only way to stop this nuisance is to prohibit peddling, and this will never be done. I remember when a boy, they used to tell of the fool killer and his annual visits. I remember how I used to dread his coming, thinking I wasn't exempt. We need a fool killer still.

The Strawberry Modern

Contrary to what might be expected by those who have given the subject very little or no attention at all. the strawberry is a modern fruit. That is, whatever improvements have been made were started not quite 100 years ago. I speak now of the garden or cultivated strawberry. There have always been wild strawberries, of course. It was necessary to have them in order to develop from them the cultivated strawberry. The immense cultivated berry that now fills the market is a product of evolution. It came from the wild berry.

Botanists tell us that there are three important species of the strawberry, viz., the Alpine, or, as it is called in England, the Wood strawberry; the Chilian and the Virginian, or American strawberry. Each of these species have prominent characteristics. The Alpine is a native of Europe and grows wild all over the Continent, as well as in the United States. It is the strawberry that we find in the woods. The berries are pointed and the seeds are on the surface. This species seems to be very fixed, as it has resisted improvement for over 2,000 years when placed under cultivation. The first improved strawberry, called the Fresant, was of this species and was originated by a Frenchman in 1660. It was not much better than the original wild ones; and while varieties of this species were culti-

vated in the gardens of England and on the Continent for hundreds of years, there seems to be very little improvement from the wild state. The Virginia strawberry is a native of the United States and can be found anywhere from the Rocky Mountains to the Atlantic Coast, and from the Arctic regions to Florida. It is our wild strawberry. It differs from the Alpine and Chilian strawberries in many ways. The seeds are imbedded in the flesh and the fruit has a very decided aroma. When grown in the same bed year after year, but form large crowns all attached to the old root. When the crown branches out, the roots form on the branches above the old roots and every year the plant is higher up. Thus, in a few years, the crowns are above the surface and refuse to bear crops. It is therefore necessary to renew fields of this species quite frequently.

There is a great difference of opinion among authorities as to the exact parentage of the modern cultivated strawberry.

Front of S. J. Clyde's Store, Pulaski, N. Y., Sept. 1, 1910.

plantations stand in the same place from year to year, the crown of the old plant divides rather than increases in size, and plants will remain fruitful for years. The species is susceptible of great improvements and most of our cultivated berries now grown are the results of crosses with this and the Chilian strawberry. When introduced into Europe, it finally became a favorite and was grown there largely till the advent of the Chilian strawberry. The Chilian strawberry is a native of the western part of America. It grows on the western slopes of the mountains from Cape Horn to Alaska. This species is the most susceptible of improvement of any species known. It is distinguished from the Virginian by the larger sized fruit in a natural or cultivated state, less aroma and by having the seeds on the surface, like the Alpine species. The crowns of the plants are very large and do not divide when

It is usually supposed that they have come from the wild strawberry growing in the fields. We had supposed that wild berries were first given high cultivation. Then the seeds were sown and a new variety was produced. This would naturally be larger than the parent. Then the seeds of this were sown, with the result of still greater improvement. This process was kept up for generations, giving the highest culture possible, and possibly varying it by making crosses with other varieties of the same species, till finally we had as a product the large cultivated berry. This is the usual explanation of the origin of our garden berries. Some authorities take this view and others claim that there is no native blood in our present market berries. I have spent much time in reading the opinions of the different authorities and I am led to believe that the cultivated strawberry is a result of a

cross of the Chilian and native Virginian types.

The first improved variety of the Chilian species was introduced in England in 1821. It was called Keen's seedling. It marks an epoch in strawberry culture, as the people of England and Europe have found that the Chilian type is better adapted to their wants than any other; and since then there have been innumerable new varieties originated of this type. It has practically driven all other types from the markets. When this berry was sent out it was supposed to be of a new species called Pines, but the Pines were undoubtedly the result of a process of change that had been going on in the Chilian species ever since its introduction into Europe in 1712.

The Pines or Chilian varieties were imported into this country from Europe, and, with the improved native Americans, were the only strawberries grown in the country 70 years ago. The native Americans were very hardy in plant, very productive, but small. One of the favorite varieties of this species was the Early Scarlet. The varieties imported from Europe were tender in plant, could not stand the winters without much protection and required high culture, but they produced very large berries of the sweetest flavor.

About 1835, Mr. C. M. Hovey, of Boston, sowed seeds of the crosses of four varieties of strawberries. One of the varieties was Keen's Seedling, and it is supposed that two of the others were of Chilian parentage. The fourth variety was Methven Scarlet, a variety of the native Virginian strawberry. From this batch of seedlings came the famous Hovey's Seedling, the first great American strawberry. From the Hovey and its crosses with other natives and European varieties have come all the leading varieties that have originated in this country during the last 50 years. Like Keen's Seedling in England, it marks an epoch in American strawberry culture. It is over the parentage of the Hovey that the "doctors" disagree. E. P. Roe is of the opinion that the Hovey is pure American, Prof. L. H. Bailey thinks it pure European or of Pine parentage, and all the numerous varieties since originated are the results, not of crosses with Virginian stock, but with other varieties of the Pine species.

I take the stand that all our cultivated berries are crosses of the two types, the ones that show great growth of plants and smaller berries are influenced more by the American blood, while those that are less hardy, make larger plants and produce larger berries are influenced more by the foreign blood. Of the first type we have the Crescent, and of the second the Sharpless. If the cultivated strawberry grown in this country has no native blood in it, why do the varieties imported from Europe during the past 50 years differ so much from our home grown strawberries? They are more particular than our most particular home productions. Another proof of the existence of native blood in our berries is the Chas. Downing variety. It has a very vigorous plant, runs all over like the wild Americans and the seeds are imbedded deep into the flesh, a trait of the natives, yet the flavor of the fruit shows European blood.

Since the advent of the Hovey, there have been innumerable crosses made, and each year there are a dozen or more new varieties launched upon the market. Some of these are improvements, but the great majority are no better than the older varieties. Among the hundreds of varieties introduced there are a few that stand out from the rest because of peculiar value. The Wilson was introduced from Albany, N. Y., about 1857. Unlike the Hovey, it did not require another variety to be planted near it, and this, with its great productiveness and firmness, have made it the most important variety that has ever been grown in America. There are many who still grow it. Yet the tendency is to lay aside the old for the new, and the Wilson is not extensively grown by up-to-date strawberry men of the present day.

President Wilder was a cross of the Hovey and a foreign variety, and was introduced in 1861. It was popular among those who gave high culture. The Monarch of the West was originated in 1867, and became very popular because of its large size. The Crescent was originated in 1870, and became a prominent rival of the Wilson because of its great productiveness under partial neglect. During many years it was the great berry in our markets, where nothing was asked for but "berries and lots of them." The Sharpless was introduced in 1873, and at once became the berry for quality. It was the gentleman's berry, while the Crescent was the poor man's berry.

Since the advent of these varieties the introductions have been so numerous that it would puzzle one to keep account of them properly. Growers were familiar with big berries, but they never before saw a big berry that was also very productive. The Bubach united these traits to a remarkable degree, and it has been largely grown. The Warfield is a seedling of the Crescent and Wilson and is very productive and firm. It is largely grown for canning and shipping. Haverland is of good size and is immensely productive. One of the most popular varieties ever grown was the Parker Earle. This is late, good size and very productive. Other varieties largely grown are the Beeder

Wood, Eureka, Splendid, Brandywine, Marshall, Atlantic, Lady Thompson and Hoffman and Westbrook. The last three are adapted to the South Atlantic states only. The others do well in most other sections of the country. Among the newer varieties that are attracting great attention we mention the Carrie, Clyde, Ridgway, Margaret, Seaford, Hunn, Hall's Favorite and Glen Mary.

The great business of growing cultivated and improved varieties for the market has practically all been built up since the war. The writer was born in 1866, and I can well remember, when a little boy, helping pick Wilson strawberries in my grandfather's patch, about the size of a kitchen floor. These berries bore better crops than you can get of Wilson now. There are varieties grown now that are as productive as the Wilson was then, but they have all been originated since the Wilson was originated. A variety seems to have a certain run, the length of which is determined by the value of the variety. After a while the variety drops back and others take its place. 'Tis so with potatoes and it is so with strawberries. We must continually produce new varieties to take the place of failing old ones.

A Bunch of 25 Plants of "Productive" Strawberry, photographed Nov. 11, 1910.

One Young Plant of "Superb" Strawberry in Fruit, photographed Nov. 10, 1910.

New Ground for Strawberries

It is now a pretty well settled fact that you cannot grow the best strawberry plants on the same soil year after year. It don't take very rich soil to grow the first crop of plants, but every succeeding crop on that soil requires more and more fertilizer to make large plants, and what is true of plants is true of berries. One of the main reasons that certain sections of the United States always send out small, inferior plants is because the crop is grown on the same soil year after year. Strawberry plants from new land are more liable to be free from disease than where they have been grown in the same place year after year. Insects such as root lice and crown borers are less liable to infest new land. The strawberry plant nurseryman of the future must not only have to give good count, pack nicely, etc., but he must grow the plants on soil that has never been cropped with plants before, or, at most, it must not have been into strawberries for ten years back.

Picking Berries on Shares

A pretty good way to get your berries picked is to let people come and pick them on shares, especially when it is hard to get regular pickers. There should be a person to oversee these pickers just the same as if they were regular pickers, and possibly they need more attention. We get most of our raspberries picked this way. Farmers' wives come with all their children and get a year's supply, either by picking on shares or buy them on the bushes. We give them every fourth quart when they pick on shares. We rather like this plan. It saves paying out money and at the same time makes a market for a part of your fruit. There is quite a grove of maple trees around our house, and some days there will be seven or eight teams hitched back of the house. We have a continuous picnic here all through berry picking.

A New Way of Growing Strawberries

Mr. W. S. Brownell of Fruit Valley, Oswego county, has hit upon a very novel way of growing strawberries which has been successful for him in such dry seasons as the past few years. He had a patch of 1⅛ acres, mostly Marshalls, in the spring of 1898. They became quite weedy during the summer and, to keep the chickweed and other weeds down, he mulched the whole bed August 1st with rye straw, covering the entire surface except the plants. The runners were kept off and, of course, the mulch kept the weeds down. There was considerable rye in the straw and this grew up quite tall and fell down in the winter, acting as a protection to the plants. More straw was put upon the field to cover the plants on the approach of cold weather. This was carefully removed from directly over the plants and placed close up around them in spring. The results in fruiting time were phenomenal. Mr. Brownell had the very finest fruit, which sold on commission in the great markets as high as $6.00 per 36-quart crate, most of the berries were sold to the local buyers, who shipped them to the great markets, paying Mr. Brownell from $3.00 to $5.50 per crate. He realized $865.00 from the little patch of one and one-eighth acres in 1899. While we believe in thorough mulching, we think it would be risky to mulch so very early in most years. Mulch put on in August makes the plants tender, and if the winter is severe, the plants are liable to be winterkilled. Such a heavy mulch is liable to dampen off the fruit stems and leaves in the spring if the weather is moist. The safest way to mulch strawberries is to cover them after the ground is frozen, take it off as soon as weather is warm enough to start vegetation and then place it between the rows and up around the plants just before fruiting time and take it away again after fruiting time, if you are to clean out the bed to keep it over for another year.

Teach Others To Do It

One thing we have learned in the conduct of our business is that we cannot do everything ourselves. On his ability to teach others to do things well, depends the success of any man who conducts a large business. Among men there will be those that are adapted to one kind of work and those adapted to something else. It is the business of an employer to find out what men are adapted to this and what to that. We used to think that there were patches of land that no one else could plow but ourselves, for fear that they would allow the team to tread on adjoining plants. There were certain kinds of plants that no one could hoe but ourself. About the last thing that we gave up was the trimming of grape vines. Our vines have gone over several seasons because we thought there was no one capable of trimming them but ourself, and we never got the time. Gradually and with great reluctance have we given up each one of these pet lines of work until now there is hardly a line of work sacred only to ourself. We find that there are men who can hoe strawberries, set out plants, trim grape vines and do any one of the various kinds of work just as well as we can, provided they are carefully shown how.

No Perfect Class

There is a certain class of people who are always giving the nurseryman a kick whenever they get a chance. There are no more dishonest nurserymen in proportion to the whole number than there are in other branches of business, farming not excluded. Would farmers like to be frowned upon and called dishonest because some of their number are tricky and dishonest? Nurserymen are, as a rule, more enterprising than fruit growers. They are the foremost in every undertaking and enterprise. Did you ever know of a fruit growers' association or a horticultural society that made much of a success without the co-operation of the nurserymen? If fruit growers would put as much energy in their business as nurserymen do, they would succeed just as well as nurserymen.

Weeding Strawberry Beds in Spring

One of the greatest drawbacks to successful strawberry culture are the weeds that get into the soil when the same land is used year after year for strawberry growing. It is safer and more economical to use new land every year. Then you avoid the weeds that develop only when the soil has been in cultivation for several years. I believe the very worst weed that infests strawberry beds is the mouse-ear chickweed. It is hard to get out of the soil, because it seeds before the strawberries are picked. It first appears in the late fall as a fine spindling weed, covering the whole surface in October like a carpet. If left unmolested, it comes up in the spring and mats the whole surface with a moss-like covering, and goes to seed about the time that the strawberries begin to ripen. The best way to fight it is to smother the small weeds as they first appear. This we do by cultivating the middles deeply and hauling earth up onto the rows of runners and plants, covering everything about one inch deep. This

smothers most of the chickweed, but the strawberry plants root nicely and grow up through the earth. It also makes the row of plants somewhat higher than the paths between the rows, and thus provides drainage. In the spring, a few of the weeds will come up and should be removed by pulling out by hand. This is very necessary, especially where the bed is on a piece where chickweed has got a foothold. We often find it necessary to weed the fruiting beds twice before the picking season. If the chickweed is allowed full sway, it covers the entire surface with a moss-like growth, crowds out the plants and causes the leaf and fruit stem to rot or damp off at the surface of the soil. There will be one or two berries ripen on a stem, but the rest will wither and never come to maturity. I consider the mouse-ear chickweed more damaging to the strawberry interests than the white grub. —L. J. Farmer in Rural New-Yorker.

Fresh Picked Fall Berries and Plants in Bearing. Photographed Aug. 31, 1910.

The Woes of the Introducer

Anyone who has ever had the experience of introducing a new fruit will agree with me that it is not all smooth sledding. We hear very much in the papers about the originator of a new fruit being defrauded by the dishonest nurserymen and public, but we rarely ever hear a word said in sympathy for a man who has nerve enough to put in a lot of money to bring a new fruit to the attention of the public. I am inclined to think that a man has to be a pretty good business man to get out whole, say nothing of making any money, in introducing a new berry. It can only be done in connection with the sale of other stock. A nurseryman can afford to pay but little for a new strawberry to introduce. He must sell the most of what he disposes of the first year to other nurserymen. Just as soon as they procure a stock, they go to watering, crowding with fertilizers to get all the new plants possible. There are many who make it an especial point to undersell the introducer. If the berry is introduced at $100 per 1,000, the price generally goes to a quarter of this the second year. If the introducer sets the price at $25.00 per 1,000 the second year, the cute nurseryman puts the price down $5.00 per 1,000 less and makes, of course, more sales with the unsophisticated than he would had he held to the same price as the introducer. A great many people do not know that a plant grown to bear fruit, not crowded and weakened by excessive manuring with nitrogenous fertilizers, is better than one grown only for to get plants, regardless of size or quality. The introducer has more interest in the new fruit than the average nurseryman, and so tries to keep up the quality of the stock. He knows that the behavior of the variety in the future is largely influenced by the methods used in propagating the plants, and so he does his best to get good plants to send out. His reputation is enhanced or hurt in proportion to the value of the variety.

There are amusing experiences that come to the introducer of a new fruit. Last spring I had a party write me that he could get the Rough Rider strawberry for such and such a price. I promptly wrote him that I would like to buy a lot

of them at that price and wanted to know where I could get them. This was the last we heard from that man. One man wrote me the other day that he could get 5,000 Rough Rider of another nurseryman for $7.00, and wanted to know if I would furnish for the same or less. Seriously I would not advise a man who has found a new strawberry to introduce it just because it is new. There are already too many new strawberries introduced every year, without particular merit or record. If you really have a good thing and know that you have it, the best plan is to sell it to some enterprising nurseryman who advertises extensively. It would astonish many people to know that we paid out nearly $3,000.00 to bring the Rough Rider strawberry to the attention of the public. Do you want to put all this money in advertising and trust to the confidence of the public? If you don't advertise you can't sell, and if you advertise it costs a lot. The originator of the Rough Rider strawberry got more clean money from it than we did.

STRAWBERRIES

Cultural Directions for Beginners

Address of L. J. Farmer before the Provincial Horticultural Society of Quebec at Lachute, Province of Quebec.

The proper way to begin the strawberry business is to start in a small way and increase the plantings as your knowledge increases. Many people make the great mistake of planting too largely on the start. They become impressed with the idea that they can get rich quickly in this business by reading of the success of some expert or by hearing some enthusiast speak from the platform of a farmers' institute or horticultural gathering. They rush into the business without knowledge or definite purpose, plant more acres than they can properly care for and when the final returns come in, they are almost always less than is expected. Natural abilities being equal, the man who has the most experience can get the best results. Of course, there are men who will learn in a few years more than others will be able to learn in a lifetime. It is the lack of proper knowledge of details that quite often causes the beginner to fail. We get general ideas by reading and listening to speakers, but the details so necessary to success come only by long and expensive experience. The most successful strawberry experts are those who have given it the most study. Every farmer and rural resident who has space enough should have a patch of strawberries sufficiently large to supply the table for six weeks or so and enough to put up for the rest of the year. It is a safe way to first learn by reading and experiment how to grow enough berries for the family; then, if we like the business and a market is within reach, we can go into it on a larger scale to meet the demands of that market. Find out what that market wants and supply it. It takes from 200 to 500 plants made up of early and late varieties to supply the wants of a family, depending on the skill of the grower and the size of the family. People will eat more berries when they grow them in their own gardens than when purchased, even at a low price.

LOCATION.—Plant your strawberry bed near the buildings, where you can see it every day; then if it gets weedy you will know it. Plant it near the road; then you will take pride in keeping it clean, so others will notice it. It saves time in gathering the berries as well as in hauling fertilizers, mulching materials, etc. Then there are odd hours often lost that might be profitably spent in the strawberry bed, if located near, whereas, if located at the other end of the farm, no one would think of the strawberries. In going to and coming from other crops, the cultivator may be run through the strawberry rows as often as opportunity affords, with great advantage. Lands nearly level are best for strawberries, if underdrained. A southern slope makes the berries earlier, a northern exposure tends to retard the time of ripening.

SOILS.—Any rich soil that will grow a good crop of either corn or potatoes will grow strawberries. Sandy soils produce earlier berries than clay and the berries are firmer. Soils made up largely of clay will produce the largest crops of the largest berries. It is because they retain the fertilizers and moisture better—do not leach. But clay must be drained well by deep, open ditches or underdrains, and well covered with mulch in winter. The ideal soil is that made up of a mixture of all kinds of soils.

FERTILIZERS.—It is economy to have the soil very rich. While strawberries do not rob the soil of much fertility (a ton of berries removes only 85 cents' worth, the balance of their make up being mostly water), it is necessary to have sufficient plant food in the soil to provide for the growth of the plants. A well fed, thrifty growing plant will ward off most diseases of the foliage, when weak plants will succumb. The vines and roots remain on the land and go to fertilize succeeding crops. The soil should be made rich before the plants are set out, by heavy applications of fertilizers to the crops that precede the strawberries It is a good plan to plant two crops of corn and one crop of potatoes

before the strawberries, and apply heavy coats of manure to the corn. Use commercial fertilizers on the potatoes and on the strawberries. Use part of the fertilizer before the plants are set, harrowing it in, and the balance during the growing season, scattered around the plants. Do not allow the fertilizer to get on the foliage and burn it. It is a good plan to fertilize the beds in the spring of the fruiting year by scattering on the rows before growth starts. About one ton of mixed commercial fertilizer is about right. One-half should be applied and harrowed in before the plants are set, one-fourth hoed in about the plants during the growing season, the balance in the spring before fruiting.

PREPARING THE LAND AND MARKING.—Plow deeply in the spring, as soon as the soil will admit of working. Harrow and remove stones or rubbish that will interfere with cultivation. Harrow again and again until the bed is as loose as an ash heap. If necessary, plow again, then harrow and harrow again. Nothing is lost in this thorough preparation, and much may be gained Usually the crop is large in proportion to the time spent in preparing the soil If ready to plant, mark the rows four feet apart and set the plants one foot apart in the rows If the plants come from the nursery and the soil is not in fit condition to plant them upon, they may be heeled in closely together until the latter part of May; then transplanted to the field where they are to remain permanently. While the plants are heeled in the bed, they should be watered when necessary and sprayed about once a week with Bordeaux mixture to prevent the growth of blight and mildew, fungii. Meanwhile the field where they are to be set out permanently is receiving the most thorough preparation. It is plowed and harrowed again and again, bringing to the surface all stones and other rubbish and ridding the soil of the white grub so destructive to strawberry plants. Mark the rows absolutely straight and have them run the long way of the piece. If straight, we can cultivate closer to the plant, and if long, less time is spent in turning around in cultivating.

PLANTING.—Trim the roots so they will be but four inches long. This will save time in planting, and they will be less liable to be crowded together in the hole. If they have been heeled in, earth will cling to the roots when taken up, and

Forty-eight Quart Crate of Fall Bearing Strawberries, photographed Oct. 10 1911.

they will receive no check in their growth by the final transplanting. Use any tool that will make the hole deep enough and allow the roots to be put down straight without doubling up. Some use a trowel and others an old hoe, with the handle cut short. In our section an adz shaped tool is used that gives general satisfaction. It costs $1 and will pay for itself in a season, where one has a good many plants to set. The operator strikes the tool into the ground with the right hand and with the left hand inserts a plant back of the blade, while the tool is being withdrawn. Earth settles about the roots, and the operation is completed by shoving earth up to the plant by a forward movement or push of the blade. Common workmen will set 2,000 plants in a day with this tool. We know experts who will set 5,000 in a day and set them well.

CULTIVATION.—As soon as the plants are set, stir the soil about them with a garden rake or common hoe. Be careful not to loosen the plant. Break the crust only. Don't dig deep. Use a Breeds weeder between the rows, running it close up to the plants. In one week start the Planet Junior cultivator, using the narrow teeth. Cultivate shallow and as close to the plants as possible. Run the cultivator through the rows close up to the plants once a week, as long as growth continues. As the plants spread, narrow the cultivator, and go only one way in the row, and always the same way. Hoe as often as possible—the time to kill weeds is when they first sprout. I think that there is hardly any limit to the amount of cultivation that can be given to an acre of strawberries and yet return a profit. There are men who get as high as $1,000 from an acre, but they spend almost their entire time upon that acre. Keep the soil loose on top where the cultivator does not reach. A narrow, pointed hoe may be used in among the runners and small plants with advantage.

BLOSSOMS AND RUNNERS.—You can get a small crop of berries from the plants the first year, but it does not pay to let them bear. It robs the plants of energy that ought to be bestowed on making a better growth, that they may produce a larger crop the following year. It is the best plan to cut every blossom off as soon as it appears the first season. The runners should be clipped for the same reason. We cut them until the plant begins to get stocky, say the middle of July, and then allow them to grow and strike root. The young plants should not mat the ground too closely. Six inches apart each way is close enough. After a sufficient number of runners have rooted, the surplus may be cut off with knives, or the row may be chopped off after a certain width is secured. Plants must not be allowed to run wild. Cutting back makes stocky plants, and these produce the largest berries and the most of them We use common shears for cutting blossoms and runners.

MULCHING.—Strawberries should be covered with some coarse material just before the severest weather comes in the fall —about the last of November. It may be applied before the ground freezes, or after it is frozen solid. If covered before, the mulch should be dropped off at the ends of the rows and carried on to the beds with forks. After the ground is frozen we may drive anywhere, depositing the material where most convenient to spread. The entire surface should be covered just deep enough to completely hide the plants. When applied, the straw will be about three inches deep. Rain and snow will pack it down to about an inch. Strawberries will not smother no matter how deep the covering, if it is not applied too early in the fall, or left on too late in the spring. Remove the covering and place it in the paths between the rows about May 1st, or as soon as growth starts. Just before the berries begin to ripen, go through the fields and pull all thistles and place the straw carefully about the plants so as to cover all the surface not occupied by the plants.

PICKING AND MARKETING.—Have a cool building or crating house where the berries may be carried, arranged and placed in the crates. Do not let the sun shine on berries after they have been picked. Sun and wind scald and discolor the fruit. Pick berries as soon as colored. Do not let a large picking ripen before you begin to harvest. Pick every other day, and leave a stem on each berry half an inch long. Do not handle the berries in picking. Take hold of the stem, pinch it off and place the berry in the basket carefully, so as not to bruise it. Do not pick in one hand and hold in the other until you get a handful. It mushes the berries. Pick each berry separately and place in the basket. If you ship to a distant market, pick before too ripe and hustle them off to the train or hold in a cool place until the proper time for shipping. For the home market, allow the fruit to ripen more thoroughly. The flavor will be better and consequently you will sell more. If there is an enterprising merchant in your town, let him sell your fruit. If dealing with the merchant proves unsatisfactory and there are others who peddle, your only course will be to peddle. This is hard work, but a good peddler will receive an average of two cents more per quart than he will get from a merchant. It is a fact, too, that no one can sell fruit better than the grower of that fruit, privided he is a good salesman. Marketing, the business end of fruit growing, is more important than growing the fruit.

FALL BEARING STRAWBERRIES

By L. J. FARMER, Pulaski, N. Y.

INTRODUCTION

FALL strawberries are at present the most interesting of anything in the whole horticultural line. They are so unusual that many people will not believe there is such a thing as a real fall bearing strawberry. I have spent much time and energy in the last few years to learn all there was to be known up to the present about them and knowing of this, the publishers of Farm Journal have asked me to write a little book about them. When anything new comes up like these fall strawberries, fakers will try to steal the rewards that ought to go to those who honestly deserve them. Every wild cat nurseryman and seedsman will be offering fall strawberry plants to sell in a year or so. The plants they offer may be of value and they may not be. It will be well to have the latest information from the best authorities before the average person invests his money and time in trying to grow fall strawberries. The variety question is the most important one thing to consider. There are varieties, if one can get hold of them, that the plants are worth their weight in gold. On the other hand, there are other varieties that are not worth the ground space they occupy. Not only is the variety question important but proper cultural and other methods of handling are important and necessary to success. I will try my best in this little book to tell all I know, honestly and fearlessly about, fall strawberries. I might say that nothing I have ever taken hold of has attracted my interest and attention equal to these fall strawberries. I am intensely interested in them and so is everybody who works with me or knows about them. My success in growing these berries has attracted a great deal of attention locally, and I have endeavored to first impress my neighbors and friends with their value. While I am not the originator of any of these fall bearing varieties, I believe I am the first to demonstrate their great value from a commercial and practical standpoint. Others have dawdled with them, but no one, except myself, has as yet shown that they can be made a business success. If I help anybody by writing this little book, I will be fully recompensed if you will pass the information along to others.

LAWRENCE J. FARMER,
Pulaski, N. Y.

October 31st, 1911.

HISTORY

The history of fall strawberries is quite interesting. Most of us have seen the advertisements in the farm papers of seeds men who offer to send a package of French Everbearing Strawberry seeds for 10c with the statement that if planted in hotbed or kitchen window in March like tomato seeds and transplanted to the garden about June 1st, you can pick plenty of ripe strawberries from these plants in August. Now the fact of it is that this is possible but not probable. There may be a few who get the strawberries the first year but most everybody will have to wait another year and quite a good many will fail altogether. These French Everbearing Strawberries have some value as they produce a small crop of from small to medium sized berries, but no one will ever overload his table or the market with what he grows. Their principal value, like many of the American varieties, is to show skeptical people that some varieties of strawberries really have a tendency to blossom and fruit in the fall. They are very similar in habits to the improved American varieties of fall bearing strawberries, and compared to the improved varieties are about as valuable as are common wild field strawberries, compared to our best cultivated kinds.

The first variety of everbearing or fall strawberry of American origin of which I have definite information is the Pan-American, which originated on the grounds of Samuel Cooper of Cattaraugus County, New York. As Mr. Cooper was inspecting

his strawberry beds in the autumn of 1898, he came across a plant with eleven young runners attached to it. The parent plant and the young runner plants were laden with blossoms and fruit in all stages of development. The kind among which this plant was found was the old Bismark, a variety of little practical value. The Pan-American has much the same characteristics as the Bismark and is supposed to be a sport from that variety. I have talked with Mr. Cooper much about the origin of the Pan-American and he tells me that there were no French or other everbearing strawberries grown on this place at that time and he is at a loss how to account for the origin of the Pan-American. The plants used to set the original patch of Bismark were received from Maryland a year or so previous. Mr. Cooper is an intensely religious man and I cannot help thinking that this Pan-American, which is the parent of all other improved fall strawberries of American origin is a gift of God to mankind through His servant, Mr. Cooper.

The Pan American is valuable principally because of its being the parent of other and better kinds. No matter what we say for or against it, we must remember that it was necessary to have the Pan American before we could have other kinds. Mr. Cooper no sooner got the Pan American than he began sowing its seeds with the purpose of getting an improved variety. The first seedling of merit was the "Autumn," which, as a variety by itself, is no improvement over the Pan American so far as its fall bearing qualities are concerned. It is a pistillate while the Pan American is perfect flowered. When Mr. Cooper got the Autumn he secured a variety that having fall bearing qualities and a pistillate, could be used to make innumerable crosses with Pan American and other varieties with the hope of securing other and better varieties. It is an interesting sight to visit Mr. Cooper and see the results of his work along this line. It seemed to the writer that it would be impossible for one mind to keep tab on all the work that Mr. Cooper has under way, and he is a feeble, frail old gentleman, too. But when one is doing such work as he is doing, they will make a little strength go a long ways. That he has been highly successful in getting other and improved varieties is shown by the "Productive" and "Superb," which are such improvements over Pan American and Autumn that they stand in a class by themselves. Mr. Cooper keeps on making crosses, sowing seeds and experimenting, and should his health allow will continue to bring out better kinds.

Others are working along the same lines. Mr. Louis Hubach of Arkansas, who has been so successful in producing new and valuable varieties of summer bearing strawberries, is now working on the fall bearing kinds with a view of producing better varieties. Mr. Edwin H. Riehl of Illinois is also very much engrossed with experimenting and raising seedlings and more valuable varieties of the fall bearing kinds. He writes me that he has many new varieties of great value that he is testing out. There are still others engaged in this work and we may look for wonderful results in a few years.

The one contemporary of Mr. Cooper who who seems thus far to have secured the greatest practical results is Mr. Harlow Rockhill of Iowa. Mr. Rockhill is an animal breeder as well as plant breeder and he writes me that he has been experimenting with a view of producing an improved variety of fall bearing strawberries for 15 years or more. He has tried the French and other kinds as parents but never attained anything like satisfactory results until he used the Pan American as a starting point. That he has secured wonderful results within the past seven years by using the Pan American as a parent on one side would be evident to any one who might have the pleasure of examining his seedlings when growing and fruiting on our place during the past three years.

Two of the most famous seedlings of Mr. Rockhill's are his Nos. 1 and 2, now called Francis and Americus respectively. These seedlings were secured by making the proper crosses with Pan American and other varieties, then sowing the seeds in window frames in February. The young seedlings were transferred to the open ground in spring and bore berries in August of the same year, being undoubtedly the first varieties of fall bearing strawberries of American origin to fruit the same year the seeds were sown. With us Francis and Americus are as far in advance of Pan American as are the Sample, Glen Mary and Early Ozark in advance of the wild field strawberry. Mr. Rockhill has also produced numerous other seedlings, some seven varieties of which having fruited with us.

How Do Fall Strawberries Differ From Other Kinds

Before it is intelligently explained to them, many people think that fall strawberries are secured by a mysterious manipulation of some common spring bearing variety. When I tell them that in order to get the best results, you must pick or pinch off the blossoms up to within three weeks of the time fruit is wanted they think that they catch on right away and say, "Then it is picking off the blossoms,

is it, can't anybody do that?" Yes, they can, if they have the proper variety. The variety is the most important part of it all. Everbearing strawberries differ from common or early summer bearing kinds principally in that they blossom continuously from May until hard freezing weather and later if warm weather comes in winter. If we pick off the blossoms from them in May there will be another set of blossoms apear in a few weeks and if these are picked off another set will

L. J. Farmer's Children among the Fall Strawberries, arranging and crating them, Oct. 26, 1911.

appear and blossoms will continue to come out as long as growing weather continues. If you pick the blossoms of June bearing strawberries in May that will be the last of the blossoms except in very rare cases, we may possibly find a stem or so in going over a large field in autumn. I have noticed that we are more liable to find occasional stems of strawberries in the fall on common varieties after an unusually dry summer. Any check that the plant may receive tends to cause them to develop the fruiting habit same as pruning trees in summer tends to make them fruit better the following year.

When I had made such a phenomenal showing with these new varieties of Mr. Rockhill's and the newspapers of our section were speaking of my results most every day, and every one in this section was talking about it, I was quite a little annoyed by reports of many people picking crops of strawberries on their common kinds. It will be remebered that in 1910, the year that I first showed what could be done with Rockhill's seedlings in a commercial way, the weather was very unfavorable for a steady growth of the strawberry plant. The summer was hot and dry. Many patches of Senator Dunlap and other varieties bore quite a crop of strawberries in September and October. The public, reading these notices in connection with the accounts of my fall strawberries, could not help from becoming confused and it is no wonder that there are a number of doubting Thomases although naturally they might have a tendency to believe my statements.

True, fall strawberries of the Cooper and Rockhill type, bear their crop of fruit in the fall of the same year the plants are set out. Thus, if we set the plants in the spring in April or May the largest crops that the plants will ever bear is produced in August, September and October of the same year. At least this is true on our place and will be true in other places of the same latitude. Second crop strawberries, such as are produced in the

fall of the same year on Senator Dunlap, Clyde, Haverland Enhance and some other varieties are only produced in the fall of the second year, after the regular spring crop has been harvested. I think it will not be necessary to explain to most of my readers that ordinary varieties of strawberries do not bear their best crop the first year, they are usually prevented from bearing at all the first year; the blossoms are picked off and the plants allowed to fruit for the first time in June of the second year.

This tendency to bear a second crop is more pronounced in some varieties than in others, but it is never dependable and should not be banked upon. For instance, while real fall strawberries are bearing even better this fall (1911) than they did last year, we hear nothing in this locality of second crops of strawberries of the common kinds and we understand that the country over, they are not near so numerous as last year. It is quite uncommon to gather second crops of strawberries. It is the rule to have true varieties of fall strawberries bear every year, they never fail.

Treatment of Fall Strawberries

The only particular difference in the treatment of fall bearing and common summer bearing strawberries is in the management of the blossoms. The plants must be set in spring if fruit is wanted that same year. If they are set in the fall fruit will not be produced to any extent until the next year, but of course the plants will become better established and make more runner growth provided they winter well, than they would if held and not set out until the following spring. The soil should be naturally strong and made rich by applications of barn manure to the crops that have preceded the strawberries. Fall strawberries, because of bearing heavy crops the same year when set out, require even richer, stronger soil for best results than do common varieties. Not only must the soil be strong and rich naturally or made so previous to setting the plants but plenty of strong high grade fertilizer must be applied after the plants are set out, during the growing season. We have been in the habit of scattering a 12 quart pailful over each row 100 feet long; using fertilizer that analyzes not less than 4 per cent. nitrogen, 10 per cent. phos. acid and 10 per cent. potash. One must be careful in using such high grade fertilizer and so much of it that it does not get on the leaves or too near the plants. About three inches from the plant is dangerous enough. It is worse to burn the plants with too much fertilizer than it is to withhold enough. Dry seasons are more dangerous to use it in than are wet ones, but never apply after a rain or when the plants are wet lest the fertilizer scatter and fall on the foliage. If fertilizer in this quantity is put on once a month for two or three months and then a rest taken until the plants seem exhausted by the large crops in the fall and then another application made, the best results will be obtained.

The cultivator and hoe must be used as soon after the plants are set out as possible and the operation kept up at intervals, until growth stops in the fall. Some varieties do best when kept in hills and these can be set quite closely, say 1 foot by 3 feet. Varieties that bear on the young runners as well as the parent plants should be set the usual distance that common strawberries are set when grown by the matted row method. I think they should never be set less than 15 inches in the row and the rows made not less than 4 feet apart. Perhaps 15 inches by 5 feet would be better for most varieties. I am going to try rowing them both ways next season, marking the ground both ways 2½x 3½, setting two plants about six inches apart at the intersections of the marks and cultivating both ways during the forepart of the season. Later on allow the plants to fill in the row and cultivate only one way.

If the plants have been set in April or early May they will blossom some time in May and these blossoms should be removed. After this it will be three or four weeks before the blossoms appear to any extent because the energy of the plant has been used to make itself better established instead of running to blossom and fruit. After a time new blossoms will appear and these should be removed. The plants will now continue to bloom until the hardest freezing weather and the blossoms should be cut away and removed every week or ten days up to within three weeks of the time we want them to begin ripening fruit. About August 1st is the proper time to stop cutting off the blossoms, then we may expect ripe fruit on some varieties about August 20th and others September 1st, depending on the season somewhat, whether the weather be warm and sunshiny or cold and cloudy.

When the rows have spread quite wide and the plants are loaded with berries in all stages of development, it is not wise to run the cultivator too close to the plants, but just go through the centers between the rows with the cultivator and finish off with the hoe. One reason that fall strawberries bear such large crops is that they are produced the first year when cultivation is being given and if we wish to get the very best results we must cultivate often and keep all robber weeds out from among the plants.

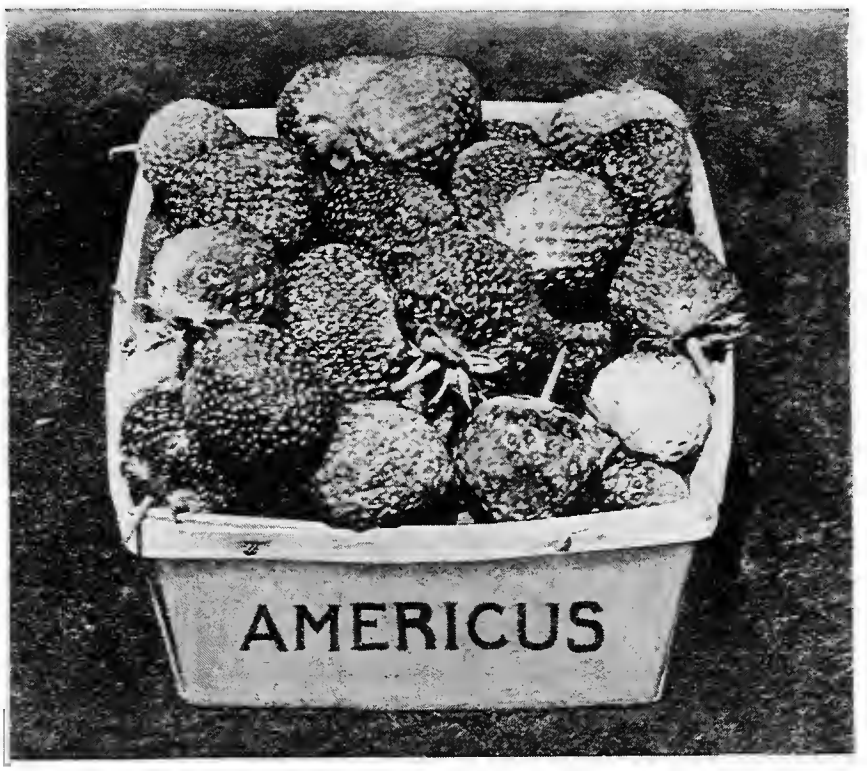
Picking Fall Strawberries

If the blossoms of Francis have been pinched off until August 1st and then allowed to grow and perfect fruit, we may, under average conditions, expect to pick fruit from that variety about August 20th. The Americus will not ripen for ten days to two weeks later, but will continue in fruit long enough to make up. I cannot give information as to the comparative time of ripening of other varieties but they vary in time of ripening same as the spring bearing kinds do.

When the fall strawberries first begin to ripen in August they will need to be picked every few days, at least three times a week, that is, provided the weather is warm and sunshiny. Later on, twice a week is plenty often enough. Along into October the sunshine and warmth will be deficient and once per week will be often enough.

When the berries first begin to ripen in August they will have better color and better flavor than after cold weather and frosts come and there is but little sunshine. The color and flavor will be largely determined by the amount of warmth and sunshine prevailing at the time.

When the berries have stood on the vines about so long they should be picked regardless of the color, for if left much longer, they will rot. They often have a pretty good flavor when the color is quite deficient. The berries that ripen in the fall are of better flavor as a rule than spring strawberries, except late in the autumn, when hard frosts have taken the flavor out of them. Every berry that is colored and ripe enough to pick, should be gathered. If the berries are sandy or muddy they should be washed before being placed on the market. If there are knotty gnarly specimens, they should be sorted out and fed to the pigs. As a good price is received for these berries they should be well sorted and graded. In washing berries in small quantities we turn a quart or two into a colander (a pan with holes punched in the bottom) and set the colander into a larger vessel like a big pan full of water. The water will come up through the colander and wet the berries. We let



Basket of Americus, photographed Oct., 1911.

them soak a minute or so and then raise and lower the colander several times, allowing the water to wash the berries. The colander and berries can then be taken to a well and water pumped over them or they can be held under a faucet of running water. The berries can then be put back into the baskets and the baskets tipped up at an angle so the water will run out the corners. When they have stood until the water has run out they can be turned into clean dry baskets and sent to market. Washing berries is quite a chore but you will be surprised at how many you can wash in an hour or so with the tools and facilities I have mentioned and which can be found in any home. Unless the soil is very sticky and rains occur very frequently there will be little necessity for washing the berries. Washing has a tendency to injure the keeping qualities of strawberires, but fall strawberries are firmer, of more substance and keep better naturally than summer varieties. While we have been compelled to wash several pickings the past fall we did not wash over one picking in the fall of 1910. This was largely due to having the plants on clay the past season while during the season of 1910 we had them on stony upland, our ideal soil for strawberries.

Marketing Fall Strawberries

For several years to come fall strawberries will have the advantage over other fruits in that they will get a large amount of free advertising. Very few people have seen them yet and when anybody grows a crop of them and shows them in market, the newspapers will publish accounts of them and everybody will be talking of them. Such advertising as this will stimulate a demand and help the sale of the fruit. Whatever you can do to bring people's attention to them should be done, even though you have to give away a few quarts to the editor and to others. By this method of advertising, a large quantity of fruit can be disposed of to people who telephone or call for it. The past autumn we put an advertisement in our local paper stating that from September 1st until hard freezing weather we would be able to furnish fresh picked strawberries for social functions and the like. We got orders from quite a large territory, by letter and telephone, from people who wished them to serve at teas, weddings, etc. In every large city and most of the smaller ones there is a dealer who caters to the fancy trade and who is always able to dispose of fancy fruits at an enhanced price. While we have had only two years of experience in growing fall strawberries for market we believe that we will have no trouble in disposing of the most of our crop by sending it to dealers who make a specialty of fancy fruits, in the nearby eastern cities. Up to the present we have used only Syracuse, Oswego and Ogdensburg, but will cover a larger field when our plantation increases and we have more fruit. My plan has been to ask 25c per quart and let the dealer pay express charges and sell the berries for what he thinks best. I have had no difficulty in selling all I have grown in this way. Twenty-five cents is a fair price and if the dealer gets 50c per quart I don't care, as he has to run all the risk and the trade he caters to is hard to get in any other way. If these berries ever get to be plentiful in the markets other methods must be selected. Sending to large hotels is another way of disposing of large quantities of these fall strawberries. I have furnished strawberries to the Hotel Onondaga, in Syracuse, for two seasons and could have furnished to other hotels in different places if we had had the berries. Until we get a larger lot of these berries growing it will be no trouble to dispose of them in the usual ways, but when we have more berries it will be necessary to adopt new methods. One thing that we have in mind is to get out an attractive special circular, telling of these fall strawberries and illustrating same in colors. These will be mailed to grocers and leading hotels in all the cities of the territory we wish to cover, accompanied by a letter stating that for a certain price, say 25c per quart, we can furnish fresh ripe strawberries during the months of August, September and October, asking them to give several days' notice in advance, so as to be sure we can supply them. In this way we believe we can dispose of all the fruit we can grow. It is our idea after the plants of these varieties get plenty to go into the business of growing the fall strawberries exclusively. We have not tried sorting into several grades and asking different prices, but of course this can be done and will pay with fall strawberries if it will pay with any.

Our Experience in 1910

In the forepart of May, 1910, I received 250 each of Francis and Americus everbearing strawberry plants from the originator, Mr. Harlow Rockhill, of Iowa. I paid Mr. Rockhill $100.00 for these plants, besides the express charges. I knew what I was doing, for Mr. Rockhill had sent me a half-dozen each of these varieties the year before and I had tested them far enough so that I knew they were very valuable.

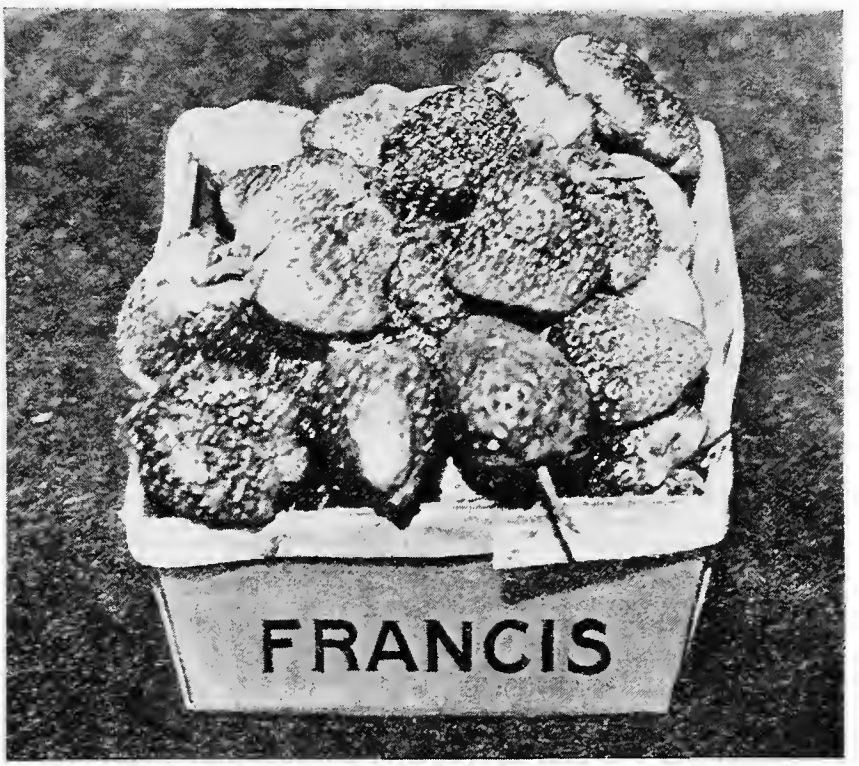
I am not used to paying $100.00 for 500 strawberry plants every day and so I de-

cided to give them something better than every day treatment. We had a fine piece of land that had been used for a hog pasture for several years and as the family garden for two years and so, here is where we decided to set the plants. It was plowed in the spring and harrowed over until fine as an ash heap. It was then marked in rows 3½ feet apart and the plants were set about 15 inches apart in the row. There are eight rows about 100 feet long.

We set them carefully, taking the greatest of pains the first week in May. In a day or so after being set we scattered a handful of high grade fertilizer between each plant in the row and started hoeing and cultivating. The hand hoeing was kept up until growth stopped in the fall and horse cultivation was kept up until the plants spread so much that it was impossible to get through without destroying many. The more we hoed and stirred them the better they grew. If we stopped cultivating the growth of plants seemed to stop.

The first blossoms appeared at the usual time and these were removed. It was some time before more blossoms appeared, about three or four weeks, but they came finally. The blossoms were removed every week or ten days up to August 1st. As the season advanced the blossoms came out more plentifully and during the latter part of July it was almost impossible to keep them off. It would surprise anybody who has not seen them to note how soon a set of blossoms will grow out after the previous set has been cut away.

Commercial fertilizer was applied about four times during the growing season, three times before the fruit appeared and once more when it was nearly gone. The fertilizer and cultivation kept the plants in best possible growing condition and they responded remarkably well both in new plants and in berries.



Basket of Francis, photographed Oct., 1911.

The first berries ripened about August 20th and were of the Francis variety. On August 23rd we picked four quarts of beautiful berries to take to a local fair. They were kept on exhibition three days and then sold to a hotel and made into a shortcake four days after being picked. Fall strawberries can be kept fully twice the length of time that June bearing kinds can. The last three quarts were gathered

November 11th and between these two dates, August 23rd and November 11th, we gathered within a few baskets of 400 quarts. These sold for 25c per quart and nearly paid for the original plants. I think that each parent plant averaged to produce 20 new plants, but many of these were killed by the severe winter. The largest single picking of 48 quarts was made September 28th. During the week of September 12th to 17th, we picked nearly 100 quarts, 60 of which were exhibited, along with several plants full of fruit, at the State Fair in Syracuse. On October 13th I took 23 quarts to Pulaski Grange, it being the occasion of their annual harvest supper, and 150 of my fellow grangers sat down to eat strawberry shortcake, the first time they ever did such a thing in October.

The plants were covered with straw about December 1st and at that time we could find quite a few green berries. A large proportion of the plants were killed by the winter, which proved unusually severe for all kinds of strawberry plants. The Francis suffered more than the Americus, due to its natural feebleness as a plant and to the fact that it was allowed to fruit too freely, which probably weakened its vitality.

Our Experience in 1912

When we uncovered our beds of Francis and Americus as well as all other varieties of strawberries the past spring we were appalled by the injury that had been wrought by the winter, although we did not think that it had been a severe winter, generally speaking. No one can just exactly tell why some winters are more severe on strawberry plants than others. There was a good deal of open weather and ice settled over the plants and it may have smothered them. The Americus wintered quite well, but nearly three-fourths of the Francis plants were killed as dead as could be. We had covered them nicely with straw, there was snow under the straw when we put it on and we were at a loss to account for the poor showing of the Francis except on the theory that they had borne themselves so near to death that the winter finished them. The plants were dug during the spring to fill orders and for our own setting and the rows were thus narrowed down so that there were few plants left except the old original 500 plants. These have been kept free of weeds, well cultivated and hoed, the blossoms removed throughout the season and are now on the approach of winter, November 1st, in the finest possible shape. They have made more plants than last year and the young plants, having had the blossoms kept off and not allowed to fruit, are far better plants than they were last year.

Our new bed plantation was not set as early as last year due to rush of filling orders for plants and other work. It was well into June before we finally got at it. We had a piece of about five acres of land in corn last year. It had been manured freely, was plowed late for the corn, there were few weeds and the corn was the best growth we ever raised for filling the silo. This piece was plowed in October and made ready to set strawberry plants any time in the spring. For reasons above given it was not used for this purpose as early as we expected but we kept going over it with the spring tooth harrow and when ready to set the plants it was in the finest possible shape. It was our intention to set the five acres all to strawberries but it came on so dry that we finally gave it up after about half of the piece had been set and this mostly to fall bearing kinds. The plants were stirred a few days after being set with hoe and cultivator, and they have had the best of care ever since. At first it was so dry that it seemed they would never start to grow. Just as they had come to start nicely we had a regular flood, water stood on the plants in many places and they received a set back that was very disastrous. It has been either too wet or too dry most all the time since they have been set and being located on rather low clay land they have not made near the growth one might expect even in such a dry season as it has averaged to be. No pains have been spared to keep the soil well stirred and the plants well fertilized but they have not made one-fourth the number of new plants that the same varieties did last year.

The season was so dry and the chances of getting a good run of new plants was so meagre that we decided that we would not work for a crop of fruit but would keep all blossoms off and allow no fruit to ripen. Our reason for doing this was to force the plants into running and making new plants instead of fruit, it being well known that if we get lots of fruit it is at the expense of new plants. Along in August we came to the conclusion after different people began to ask us how the fall strawberries were coming on, that if we did not allow them to fruit this year and had no fruit to show to our neighbors and to take to the fair, people would say that they were a fake and not to be depended upon to bear fruit every year, but just like other strawberries, they would bear an occasional crop in the fall when conditions were favorable. I was so impressed with the truth of this that I ordered the cutting of blossoms to be discontinued August 20th, just twenty days later than ought to have been done to get best results from the fruit.

In one respect it was a good thing that we delayed the fruiting until late. Yes, it was a good thing in two ways, we got more plants and we have proved how late they could be made to fruit heavily.

This year the State Fair in Syracuse began September 11th and lasted all the week. We were only able to show eight quarts of ripe berries at this fair, but we had 20 plants of 12 varieties of fall bearing strawberries on exhibition and as only about one berry was ripe on a plant they showed the green berries in all stages of development as well as blossoms in the greatest perfection. Thus we could make a much better showing of plants in fruiting than we could last year and they attracted the greatest attention. From this time on pickings were made at frequent intervals. The last picking was made October 26th and it was also the largest, 84 quarts were gathered at this time. These were used for various purposes. One crate was sent to a large hotel in Syracuse, 16 quarts were sent to a grocer in Oswego and one crate was sent to Massachusetts on a telegraph order. Quite a few quarts were sold to townspeople. Several quarts were used to send to editors and publishers of agricultural and horticultural papers in various sections of the United States. Since that date we have had a heavy freeze, even the ground froze, and although many of the plants are still loaded with fruit we fear this fruit will be soft and worthless, even if it warms up and the sunshine comes out enough to ripen it. We expect, however, to find quite a number of fruits under the leaves well into November.

Basket of Productive Strawberries, photographed Oct., 1911.

The plot of ground that these fall strawberries is on lies open to all the winds and changes of weather and there could not have been selected a more unfavorable piece so far as frosts are concerned. It is low, wet and sticky. When we get a frost anywhere on the farm we get it there. We have had very hard frosts earlier in October and they have injured some of the berries, but not near what one would expect. I was surprised that strawberries would stand so much freezing, they appear to be as hardy as apples. The only specimens that were injured were those out away from the foliage and well up from the ground. The berries that lay

on the ground or under the leaves were not injured at all except possibly to rob them of flavor. A curious thing is that the blossoms will be killed with frosts and in a few days if the weather is favorable more blossoms will come out and the new blossoms will be all right and show no black spot in the center such as frosted blossoms show.

We fruited nearly two acres of these fall strawberries this year and because of unfavorable conditions we did not pick any more fruit from the two acres than we did from the eight rows 100 feet long last year. Had these plants been set the latter part of April and the blossoms picked off only up to August 1st, and had all other conditions been the same as last year, we would have picked 20,000 quarts from the two acres provided they had been all Francis, Americus and other good kinds. The most of the plants were inferior kinds and, as we have before stated, the conditions were in every way against getting the best results. We know that we can grow more quarts to the acre of the best fall strawberries than we can in the summer season grow from common kinds. Of course it takes a longer season and more work, but then don't it pay at the increased price? There are many things about these berries that I cannot tell you that can only be learned by actual practice.

Mulching and Frost Protection

We have not mulched these strawberries during the time we have been testing them except for winter protection. As I have before stated, getting new plants has been the principal end and berries have been secondary. After plants become the second choice we intend to use some mulch to keep the berries off the ground and from being splashed with sand or mud. Whatever is used is immaterial if it is porous and keeps the fruit clean. It may be waste excelsior, straw, marsh hay or cut corn stalks. This should be put close up to the plants and under the leaves so that all the fruit stems with the fruit on them will rest on it and be kept up from the ground. The soil not only discolors the berries and makes them dirty, but it draws the flavor out of the berries if they lie on it while ripening.

I have given little attention to protection from frosts for the same reason that I have neglected mulching. If these berries are set on uplands where all kinds of strawberries do best, they will need very little attention so far as frosts are concerned. During the fall of 1910 we had a small field well covered with plants and we did cover them several nights but it hardly paid. Most every time we covered them we would fail to get a frost and when they did freeze there was very little damage done. We used old sacks, blankets and the like during the coldest nights of October and in this way prolonged the pickings for some two weeks. This year we have given no attention whatever to protection from cold and we can see very little bad effects from frosts although they have been more severe than last year. We find that frosts do more good than harm to these berries in most cases. One drawback to most varieties of fall strawberries is that they blossom too much. They produce more blossoms than any strawberry plant can possibly bring to maturity. If frosts come, they kill the blossoms but do not injure the fruit that has set.. This fruit goes on growing and develops to larger specimens than it possibly could if all blossoms set and grew into fruit. There is no question but what under extreme conditions it will pay to have some protection from frosts. We have decided to provide ourselves with orchard heaters such as they use in the apple orchards in Colorado and elsewhere. These can be used to keep the frosts away from spring bearing kinds as well as fall bearing kinds.

Cost of Growing Fall Strawberries

The only item of expense in growing fall strawberries that is greater than in growing spring bearing kinds is in keeping off the blossoms, except that we possibly give them better culture and more fertilizer. They bear the first year and pay whatever they are going to pay the first year the same as corn or potatoes. Other strawberries require two years to get returns from them. While these fall bearing varieties may be fruited in the fall of the first year, in the spring of the second year and again in the fall of the second year, we think it best with most of the varieties, to fruit them only in the fall of the first year and set out a new bed every year. People can suit themselves along this line. There are those who prefer to grow but one crop of berries from common strawberry plants while others keep the plants fruiting for several years. Those who get the very best results usually fruit but one time and plow the bed under after fruiting. With fall strawberries, however, it makes a lot of difference what variety we grow, whether we fruit them more than the first year or not. Those varieties that fruit freely on the young runners the first fall will hardly pay to carry over and fruit twice the second year.

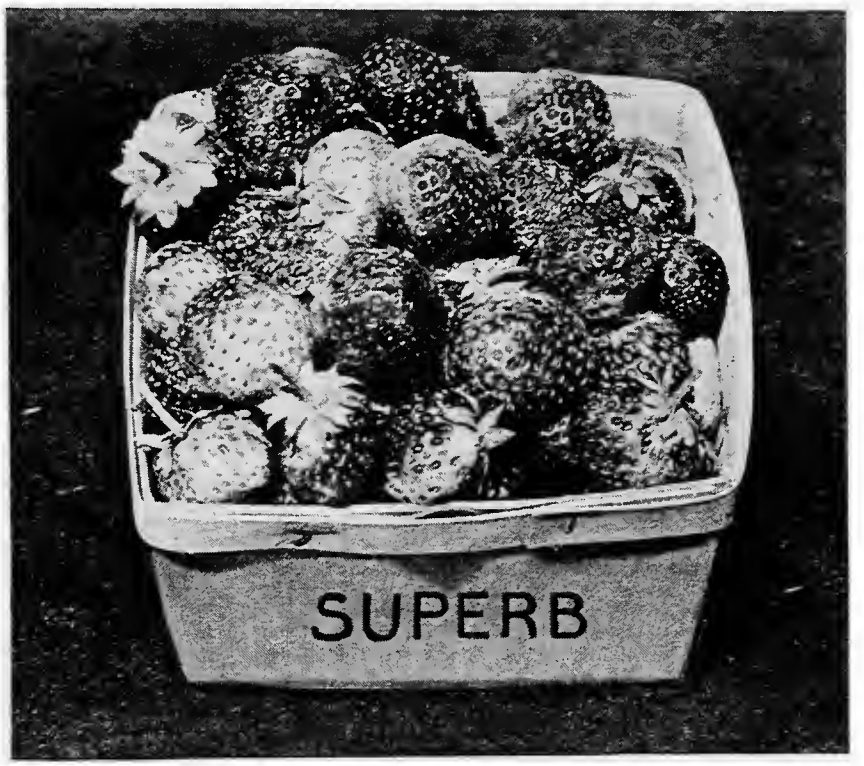
It is better to take the plants up in the spring and set them in a new place, rather than to keep them there and fruit them. The varieties that do not fruit the first year on the young runners, but only on the plants that were set there the spring before, will fruit the first fall and twice the next year with profitable results.

In handling the blossoms it is necessary to cut them off from all kinds of strawberries as soon as they come out in May after the plants have been set. The cost of removing what blossoms appear on the plants from this time up to August 1st should be added to the cost of producing fall strawberries over June bearing kinds. The actual cost is hard to determine. It was not much with us this year, because the plants were scattering and there were few young plants that blossomed. If we had two acres that made as good growth as did our eight rows in 1910, the expense of cutting off the blossoms would be considerable but of course the crop of fruit would be proportionately larger and we would not feel it in the long run, at the close of the season. Roughly guessing, I would say that this past season it would take one person a day to go over our two acres of fall strawberries and cut the blossoms. Had these plants done as well in proportion as they did last year we should say that it would take the same person all the time to keep the blossoms off from two acres. When I say all the time I mean from the time that the plants blossom the second time, the latter part of June, up to August 1st; not much over one month.

Yeilds and Returns

The yield of fall strawberries is determined by the conditions same as all other kinds of strawberries. They seem to be able to stand more pushing and fertilizing than most other kinds and this seems to be necessary to obtain the best yields. Treated as I have treated them, if one plants the right varieties he can pretty surely bank on a yield of 10,000 quarts to the acre. This would seem to be an unusual yield from June bearing kinds, but it must be remembered that fall bearing strawberries are in fruit 80 days or more and they have a greater chance. There will blossoms appear and turn into fruit within four weeks and all this time other blossoms are appearing which will turn into ripe fruit later on. This thing goes on until frosts cut them down in the fall.

I think that 25c per quart is a good safe price to bank on. They can be grown for less but it will be several years before we



Basket of Superb Fall Bearing Strawberries, photographed Oct., 1911.

will be compelled to take less and let us not take less until we have to. At 25c per quart and a yield of 10,000 quarts to the acre it talks big and reminds one of stories of returns from Ginseng and other South Sea Bubbles. I do not think there will be an over supply of these berries for many years, possibly never, because there are so few people who will give the necessary time to growing strawberries any way and these fall strawberries are even more exacting. But I must impress it upon my readers that if they succeed with these fall strawberries at all they must give the very highest culture possible and fertilize to the limit or they will fail. If you do this 10,000 quarts to the acre is not a wild estimate of what ought to be grown. The matter of getting a good yield is more important than price. If the yield is large the berries will be large fine colored and of fine quality and the price will surely be good. The quality of the berries is usually determined by the yield. If the yield is poor the quality is poor.

If one will sort his fruit and make about three grades he can possibly get a better average price for the whole crop. If he retails it and delivers it direct to customers he may be able to save the dealer's profit and average 35c to 50c per quart or even more, depending on his trade. Summer strawberries often sell as low as 6c per quart. If fall strawberries should go to 10c per quart there would still be good money in growing them.

Varieties

Pan American (Perfect Flowered)—This is the first fall strawberry of American origin and the parent of all other varieties. It was discovered by Samuel Cooper of Cattaraugus County in 1898. The plants are sturdy strong growers, making many leaves but few runners and new plants. In most instances it is necessary to divide the old plants to get new sets. The plants are inclined to mildew of the foliage which affects the fruit. The fruit is of medium size, of good color and flavor and produced in good quantities. The fruit is borne up under the leaves and is inclined to mildew and rot in wet muggy weather. It must be hunted among the leaves if you find it at all. The frosts have little effect on the blossoms or fruit because both are hid by the leaves. Bears freely on old plants and young runners every season. If blossoms are not cut it bears a scattering crop from June to December in this locality. No matter how late blossoms are picked they continue to come on the plants until frosts kill them.

Autumn (Pistillate)—A seedling of Pan American, secured by Samuel Cooper by planting seeds of Pan American. The young plants of Autumn are rather small and are secured in greater abundance than Pan American. It is not as uniform in growth as Pan American. Some of the parent plants will produce lots of runners while others will not produce over one or two and some none at all. The old plants of Autumn bush up and form more crowns even than Pan American. The parent plants attain great size and yield an immense crop of fruit under right conditions especially in the spring of the second year. The plants are not so persistent in fall fruiting as Pan American and for best results we would only remove the first blossoms that come out after the plants are set out. The plants are fine glossy appearing and attract the eye at once. The berries are medium to small in size but are produced in great abundance. They are especially glossy and attractive in the spring crop. The berries are produced only on the parent plants. For best results in fruiting we would keep them in hills. Autumn has been used as the pistillate parent to produce many new and valuable varieties.

Productive (Pistillate)—This is the strongest growing plant of all the fall bearing strawberries I have ever seen. It is a seedling of Autumn and Pan American produced by Samuel Cooper. The plants are very large and heavy rooted, producing a phenomenal crop of medium to large fruits. The young plants are produced in good quantity. The leaves are large, thick, leathery and glossy. The berries literally lay about the plants in heaps and piles. The size and quality is determined by the quantity produced. If we should seek for the largest specimens and of the best quality it would be necessary to remove a large proportion of the blossoms.

This variety has very prominent seeds, is very firm and a good shipper. The berries are borne only on the parent plants, the young runner plants hardly ever bearing fruit. It is adapted for running two years. For best results we would keep them in hills and remove only one set of blossoms. This year we picked the blossoms until August 20th and there were about 50 per cent. of the plants that did not bear, but the others fully made up for them. Mr. Cooper says that on the average they will bear a pint of fruit to each plant the first fall, a quart to each plant in the following spring and if the leaves are mown off after the spring crop, they will bear another pint the second fall. To do this the plants must be grown in hills with all runners cut off. Suppose the plants are set one foot by three feet. There would be 14,520 plants to the acre and if each plant bore two quarts in the two years, this would be 29,040 quarts to the acre in two years. If we were planting for commercial purposes, we would include Productive most assuredly.

Superb (Perfect flowered) — Produced by Samuel Cooper by crossing his "Cooper," a spring bearing variety having fall bearing blood in it with Autumn and then crossing the seedling variety produced, on "Sherman," another spring bearing kind having fall bearing blood in it. I might say here that Cooper and Sherman are both seedlings of Autumn crossed with Pan American, but bear fruit only in the spring. It can be seen that Superb is well permeated with fall bearing blood. if turned in a lathe. It is not produced in as great abundance as Productive, but each fruit is large and fully developed and above all it has the finest flavor. The fruits are only borne on the parent plants. Hardly ever do you find a young plant bearing fruit. This variety does its best when planted in hills and runners cut. I might say that I am receiving the best of reports from those who fruited the Superb during the past autumn. These reports came from everywhere.

Basket of Pan American Strawberries, photographed Oct. 1911.

The plants of Superb are good average sized plants, are strong growers and stand the winters best of all the kinds we have tested, with the possible exception of Americus. The young plants vary in size, the first produced on the runner being large, while the last formed ones are quite small, but all are vigorous and healthy. While the roots of Productive are large and fleshy the roots of Superb are small and wiry. One parent plant of Superb will spread its runners over a large surface, the runners being long and quite numerous.

The fruit is very large, round, rich dark colored, glossy, attractive and smooth as

Teddy Roosevelt (Imperfect) — This variety was sent us by a grower in Delaware, who writes us that it is a seedling of Autumn and Pan American, much superior to Autumn. We have not fruited it sufficiently to determine the exact difference. The plants and fruit closely resemble Autumn.

Francis (Perfect flowered)—A seedling of Pan American and Louis Gauthier, produced by Harlow Rockhill, of Iowa, who sowed the seeds in window frames in February and picked ripe berries from the plants in August of the same year. The young plants are small and inclined to be feeble. They require more than the usual

amount of petting, but when they start to grow they are vigorous, healthy growing plants. The old plants crown up and cover quite a large space. The leaves are glossy and attractive. The plants are inclined to have a tender, aristocratic appearance and hug the ground quite close. The fruit is produced on both old and new plants. We never saw anything so persistent in blooming as are these plants of the Francis. It is practically impossible to keep the blossoms off the Francis. You can cut every one off and in three days more you can see more bloom. The young runners will often blossom before the young plant has struck root. The fruit is very large, bright, glossy colored and produced in surprisingly large quantities. With me, Francis is the best variety and produces the largest crop of the biggest berries. The plants are so weak, however, that the average person will not get as good results with them as with Americus. The berries are rather irregular in shape, square and elongated, not as fine flavored as Americus, but of good average quality. We are confident that we allowed our plants to fruit too late last fall and they exhausted themselves. In the future we purpose to let this variety fruit in August and September and then remove the blossoms and fruit stems from that time on until winter; giving the plants time to recuperate. It does best when grown in matted rows and all runners allowed to grow and fruit. The berries are produced well out from the leaves where the sun can reach them.

Americus (Perfect flowered)—A seedling of Pan American and Louis Gauthier, produced by Harlow Rockhill at the same time he produced Francis. The plants are strong growers, closely resembling the Francis, but more hardy, stronger and healthier. They make more new runners and the young plants are larger. The plants do not seem to be injured by fruiting in the fall. It stands the winter well and the roots are bright and healthy in the spring, same as other kinds of strawberry plants that do not fruit in the fall. The plants do not ripen the fruit as early as Francis but they continue in fruit long enough to make up. It is not quite as large on the average as Francis but it produces the largest single specimens of any fall strawberry we have ever fruited. We do not think it quite as productive as Francis, but it surely is finer in flavor, surpassing most all other kinds in quality. It seems to do its best on clay, although we had a fine crop of them on stony upland (ideal strawberry soil) last year. They are very large on clay, while on the other kind of soil they were only medium in size. The color of the fruit is fine, but they are not as glossy as Francis. The fruit is borne freely on the young runner plants as well as on the parent plants. This variety does best when grown in matted rows, allowing all runners to grow and bear fruit. If I were to pick the best kind for the average grower I should select Americus. The plants do not crown up and grow bushy quite as much as Francis. The berries are produced well out away from the foliage.

Rockhill's No. 16 (Perfect flowered)—A seedling produced by Harlow Rockhill. The plants are better runners and produce more plants than any variety we are acquainted with which at the same time bears a good crop of fruit. There are many varieties of strawberries that have a slight inclination to fruit in the fall that produce a large number of runners and new plants. The most of the varieties, however, that are inclined to great runner production are slight fruiters. No 16 seems to be an exception to this. It will produce about as many runners as Senator Dunlap. In fact makes one think of that variety, and will at the same time, bear an enormous crop of fruit. The blossoms and fruit are largely hid by the foliage and are not much affected by slight frosts. The plants are not inclined to fruit on the young runners. The berries are large dark colored very much like Dunlap in shape and color. It is firm and of fine quality. The berries are borne on the parent plants only. Does well in either hills or matted rows. Will be named this season and offered to the public in the spring of 1912.

Rockhill's No. 6 (Perfect flowered)—A seedling of Mr. Rockhill's that has fruited two years with us. Were it not for the fact that it produces very few runners and new plants, like the old Pan American, it would be one of the most popular of all his seedlings. The plants are strong growers and bear an immense crop of fruit, probably the largest crop of any fall bearing variety I have ever tested. The berries are not as bright colored as some, but are large, shaped much like Corsican or Uncle Jim and remind one of those varieties in color and other respects. It bears on old and young plants and does well under either hill or matted row culture. This variety will be introduced when a sufficient supply of plants can be grown.

Rockhill's No. 7 (Perfect flowered)—Another of Rockhill's seedlings. It makes plants quite freely and bears on the old and young runner plants. The berries are large, dark colored and elongated. Not very satisfactory as a fruiter.

Rockhill's No. 9 (Perfect flowered)—Another of Rockhill's seedlings. It makes the most plants of any one of all his seedlings we have tried and is the most productive on heavy soil of all his seedlings. It was not very satisfactory with us last year on

stony upland. The plants are healthy and free runners, but are small individually. The fruit is medium to large, runs to a point, and is well hid under the foliage. It bears on the parent plants only. Does best when kept in hills with runners cut. Has not been introduced to the public.

Iowa (Perfect flowered)—Was known as Rockhill's No. 8, until purchased and introduced by Mr. Crawford in the spring of 1911. The plants are vigorous growers and make a good many large healthy new plants. The fruit is medium in size, round, glossy and very attractive. Mr. Crawford told me on his place last autumn that he considered it the best of all Rockhill's seedlings. I have tried it on stony upland and on clay, but with three years of experience, it does not equal either the Francis, Americus, Superb, Productive or Rockhill's Nos. 6, 9 or 16. I believe the plants are the prettiest growers of all and we hope to do better with it in the future. It seems to bear mostly on the old parent plants. We would recommend growing in hills with runners cut.

The above are all the varieties of fall bearing strawberries I have ever tested.

How to Produce New Varieties

New varieties are produced by crossing different varieties and sowing the seeds. I am often asked if different varieties of strawberries will mix and make a new kind if planted close together. The plants will mix and if you set the young plants out you are liable to have two varieties, but the plants never mix and form a new variety. New varieties are only made by crossing the blossoms and sowing the seeds from the berry that grows from that blossom. If you plant seeds of a pistillate variety it has been crossed with some perfect flowered variety near it and the seeds when sown will produce a new variety. If you wish to make crosses of two varieties that are both perfect flowered, you must remove the stamens from the blossoms you wish to permeate with pollen from the other blossom, and carry the pollen from the one blossom to the other with a fine camel's hair brush. This work must be done when the bloom first opens before it becomes pollenated naturally.

Mr. Cooper's method of raising new varieties of fall bearing strawberries is

Basket of Rockhill's No. 9, photographed Oct. 10, 1911.

as follows: He first makes the crosses, then gathers the fruit when fully ripe and mushes it to a pulp and mixes with sand. A smooth piece of soil is selected in the garden and the seeds sown there in July or early in the fall. They are gently stirred into the soil with a garden rake. A wide board is spread over the place where the seeds are sown and left on until spring. Some of the seedlings will show in the fall but most of them will not come up until spring. The board is put on to keep the weeds from growing and the seeds moist so they will sprout. Of course the board is removed in spring. The young seedlings will come up very thickly and will have to be separated and given more room. It may be necessary to transplant them several times. Finally they are set out the usual distance in the field and allowed to grow and fruit. Some of them will show fruit the first year but the most of them will have to be carried over until the following season.

The trouble of raising new varieties is not so much in growing the seedlings as it is in separating out the good from the bad and selecting the valuable from the worthless kinds. . This requires real skill and experience. The public owe a debt of gratitude to such experimenters as Mr. Cooper and Mr. Rockhill that can never be paid.

Observations

One who works among fall strawberries for three years or more will learn many things that are valuable to him if he expects to continue growing this class of strawberries that cannot be learned in books.

Varieties that do well with one person or on a particular kind of soil may be a complete failure with another person or on a different soil. As an illustration, the Americus did not impress me nearly as much last year on stony upland as it does this year on clay, although it was fine last year. While the Iowa is fine with Mr. Crawford it is only ordinary so far with me.

There are varieties that hide the blossoms and berries under the foliage and undoubtedly suffer less from frosts than varieties that shove the blossoms and berries well out from the foliage. The berries may be protected from frosts but when you are picking them you have to turn over the leaves and hunt for every berry if you get them all. We prefer a variety like Francis and Americus that shows all the fruit when ripe. You can walk along the row and see every berry that is ripe without stooping and turning the leaves of every plant.

We have manipulated the blossoms of our fall bearing strawberries so that we have picked strawberries every month from June to November inclusive. We think, however, that it hardly pays to have the fruit come before August 1st, because it interferes with raspberries and other small fruits. We also think that October 15th is late enough to have pickings from them. Berries that are grown in October are all right if heavy frosts do not rob them of flavor, but the sunshine is deficient and if heavy frosts occur the plants must be protected or the berries will be poor flavored as well as poor colored. It requires warm, sunshiny weather to put flavor in fruits as well as color. It seems necessary to prolong the season of these berries into November to attract people's attention to them, but for practical purposes we do not think it advisable to try to get fall strawberries at the North in November.

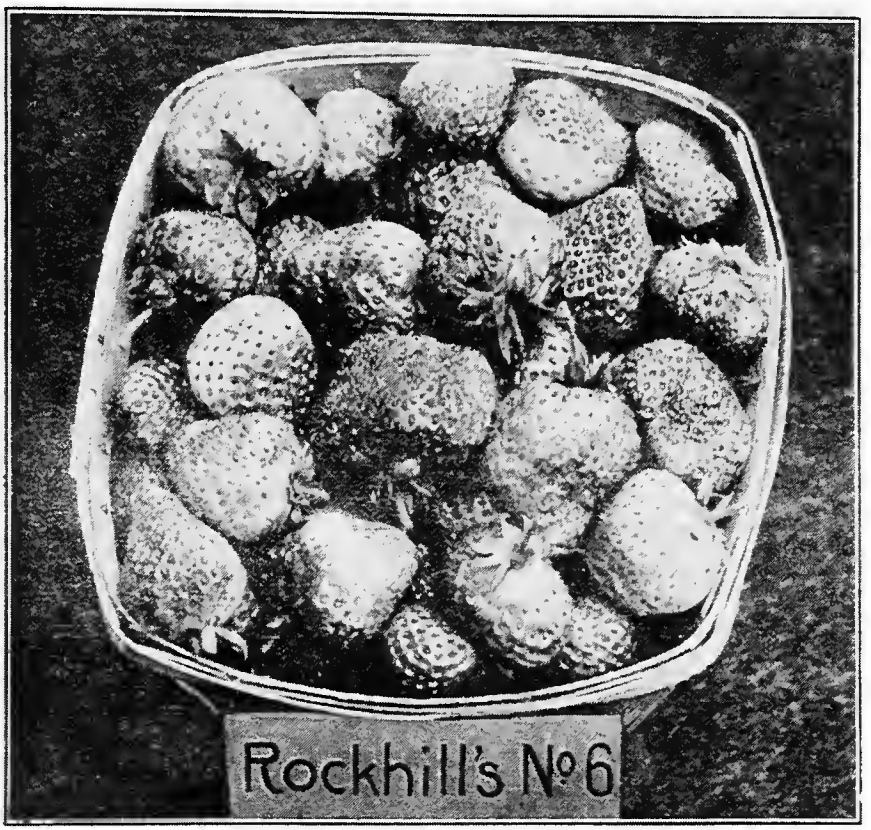
At present the all absorbing idea with everybody is to get a supply of plants. The fall strawberries have been on the market long enough to grow a fair supply of plants, had conditions been right. Naturally these plants do not run and make as many new plants as do other varieties, and in addition to this it has been very dry and unfavorable for the normal growth of strawberry plants during the past two years. When winter closed in last season we had more plants of Francis and Americus than all others combined, but the winter took a large part of them. Mr. Rockhill thinks there will be an enormous demand for these plants when they get more plentiful and cheaper. It will be some time before this happens. One thing I have learned about growing plants that may be valuable to others is that it pays to tip in the young runner plants instead of waiting for them to strike root themselves. If every young plant is carefully layered and held in place by a stone or some soil, it is wonderful how soon it will root and then make more runners to make more plants. I believe if strawberry plants are carefully tipped or placed, that you can grow three times the number of young plants from a given number of parent plants than you can when they are not tipped.

One thing that those interested in fall strawberries have to overcome is natural prejudice to any innovation. There are people who will tell you that strawberries have no business to ripen in the autumn, that spring is the proper time for them. There seems to be some feeling among growers of apples and other large fruits that fall strawberries are out of place. When shown at fairs the apples and pears have not much chance of attention beside the fine looking fall strawberries.

This is where the small fruit grower is coming to his own. In the past the apple

and other large fruit growers have had all the advantage in that they could advertise their fruit at the fairs, while the berry man had to go way back and sit down, his berries ripened in another season. Now we strawberry growers have an equal show at the fairs. Some people can not be convinced that there is a real fall strawberry. An editor of a leading fruit paper in the West wrote me that his neighbors were picking plenty of second crop strawberries and before I said much about them, he advised me to be sure that I had a real fall strawberry. It reminds me of the story I had heard of the boy and the giraffe. The boy had heard stories of the giraffe but could not believe them so he resolved to go and see the animal when he had an opportunity. The next circus that came to town he went just on purpose to see the giraffe. He looked at the animal all over from head to foot, noted its long neck, then went out of the tent muttering to himself, "There ain't no such animal, anyway."

There are those who will set out these plants and not comply with the requirements and then condemn the fall strawberries because they do not do as well with them as with those who do comply with the requirements. Mr. Rockhill sent several of his seedlings to the Geneva, N. Y., Experiment Station to test. In a bulletin issued last summer they attach very little importance to these fall strawberries. In most respects condemning them. The trouble seems to be that they do not realize what can be done with them and will not make the effort to try them. When these fall strawberries are given only ordinary culture and treated like spring bearers they are inferior to many summer bearing varieties and naturally would be condemned. When grown for their fall bearing qualities they assert themselves and prove their great value. The horticulturist at Geneva will not even spend the time to come and see these berries growing on my place.



Basket of Rockhill's No. 6, photographed Oct. 26, 1911.

A Missouri correspondent of the Rural New Yorker throws a wet blanket over the enthusiasm for fall strawberries in a late (November 4th) issue. From a careful reading of the article I should judge that his conditions were very unfavorable for the best results with these fall strawberries and further he has not complied with all the requirements. For instance, he is in doubt whether it pays to keep the blossoms off up to a time when fruit will ripen September 1st. My experience is that it will hardly pay to let these strawberries bear from June until November, on the same plants. You will not get much of any crop at any time. I think it is here that most of the people fail with them. They try to get the plants to do too much. There is some sound advice in this article but the general tone is discouraging.

We are often asked if the flavor of fall grown strawberries is equal to June bearing kinds. People say,—"Do they taste the same as other strawberries?" Our experience is that fall strawberries are of better flavor than spring bearing kinds. When the weather is warm and sunshiny they are far superior. When it gets cold and rainy and there is hardly any sunshine they have a sort of natural flavor neither sweet nor sour, nor of much character. Under some conditions they are milder in flavor, less sour and not so juicy, having more pulp than spring bearing strawberries. All our customers speak of the fine flavor of these fall strawberries.

One peculiar thing about the Pan American strawberry is that it has a tendency to revert back to the spring fruiting habit and lose its fall fruiting characteristics. This will not happen if the plants are given average conditions, but if you fertilize the plants with rich nitrogenous fertilizers and give high culture to get a large supply of plants, they will produce the extra plants to the expense of fruit and these plants will incline to runner production the next year instead of producing the usual amount of fruit. This tendency to revert back to the spring fruiting habit is an inclination held only by the Pan American. Its seedlings are true as steel under the very highest culture and richest fertilizing. It would seem that the Pan American variety was only a step in the transition from the spring to the fall fruiting habit. Some people have asked me whether if we find a plant of any strawberry bearing fruit in the fall, if we take this plant up and propagate from it year after year will it produce a fall variety that is to be depended upon? Theoretically speaking I should say that I would think this would be the tendency, but Mr. Cooper tells me that he has never been able to find another variety that stayed fixed, although he has tried it on a number of plants that fruited in the fall. The Pan American was the only kind that bore fruit the following fall and kept it up from year to year.

One of the drawbacks to growing fall strawberries is the pollenization of the blossoms. If cold, wet, sour weather is predominant at the time the plants blossom , there will be imperfectly fertilized blossoms and many knotty, misshapen berries. However, we are just as liable to have unfavorable weather for blossoming in May as in August, and yet no one would think of discarding summer bearing strawberries just because we sometimes lose a crop by improper fertilization of the blossoms on account of a wet May. The only way is to take things just as they come.

What Will the Outcome Be

Fall strawberries are a comparatively new thing, that is, the real large fruited productive fall strawberry is a new fruit. Has it come to stay? What effect will it have on horticulture permanently? Those of us who are interested are very sanguine, while those who are not interested regard it as a novelty that will have a brief run of popularity and then die out.

Mr. Rockhill thinks there will be a great demand for the plants and berries when the public gets waked up. Mr. Cooper thinks that they will surpass all other kinds of strawberries when they get plentiful and better known. The fact that they bear a large crop of fruit in the spring as well as in the fall he thinks will have a tendency for them to drive all other kinds out.

My belief is that the idea has come to stay. I think that experimenters will produce a variety that will be entirely satisfactory from all viewpoints. This will be quite possible if as much improvement is made in the next ten years as has been made in the past. Most everybody will try these new kinds of strawberries because there will be so much said and written about them. No one can tell who will succeed with them until they try them. My idea is that the growing of them for market is a high class horticultural pursuit similar to growing the finer grades of vegetables and fruits quite similar to greenhouse work. Those who succeed in growing fine celery and crops that require careful, painstaking work, will succeed equally well with fall strawberries. The slipshod fellow who tries everything and succeeds with nothing will try the fall strawberries but he will not succeed. For the present I know of nothing that the careful, painstaking man can go into that offers greater chances of reward and success than fall bearing strawberries.

L. J. FARMER,
Pulaski, N. Y.

Exhibiting Strawberries at Fairs, Expositions and the Like

The following notice appeared in the Rural New Yorker during the last days of 1893:

"The largest collection of strawberries shown by any state or exhibitor at the World's Columbian Exposition, was shown by L. J. Farmer of Pulaski, N. Y., who exhibited nearly seventy varieties at one time. The marvel of it all was the perfect condition in which it was received, owing to the careful manner in which it was packed. Not only did they come in good condition, but they kept perfectly when exposed to the air for eleven days."

It may be of interest to others to know how we packed these berries to stand the 800 mile ride to Chicago and rough handling they got by the express people en route.

I went through the fields and selected about fifteen berries of each kind, the largest and finest appearing, not too ripe or too green, just in perfect condition, the very fruit you would select if you were going to ship to a distant market to sell for a fancy price. The packing and placing into the crates was done by the ladies of our house. The berries were picked in the cool of the morning after the dew was off and carefully labelled and packed at once.

For crates we used packages similar to egg crates, with a compartment for each berry. A piece of cotton wadding (not batten) was cut up into little squares, each square being about six inches each way. The berry was placed in the center of the square and gently pressed into its compartment in the crate. About a dozen specimens of each variety were sent for this World's Fair Exhibit. Little slips of paper with the name of the variety were put into each compartment.

The cotton absorbed the surplus moisture and when the berries were opened in Chicago, two days later, they were in perfect condition and kept for eleven days when placed on the plates.

Diploma received by L. J. Farmer at World's Columbian Exposition, at Chicago, in 1893.

Many people will make the mistake of using batten instead of wadding. Wadding has a glazed surface and will not stick to the berries. The batten will stick to the berries and cannot all be removed, giving them the appearance of having whiskers.

During the Pan American exposition at Buffalo, the State of Missouri showed a whole carload of fresh picked berries, in fine condition. They were picked when just beginning to ripen, kept cool until loaded into the car and sent by refrigerator car to Buffalo, arriving in the best of shape and winning the highest awards.

When the Louisiana Purchase Exposition was on, I was selected by the authorities to superintend the gathering and preparing of a whole carload of strawberries for the State of New York to show at this exposition in St. Louis, but finally the idea was abandoned as too costly considering its advertising value. It is my idea that a few berries well shown in the best of condition is a better advertisement than a whole carload shown in half decayed, demoralized condition.

For the past two years I have been showing fall bearing strawberries at the local fairs and the New York State Fair in Syracuse. These fairs are not over 40 miles from our place and we do not have to take the pains that we would were we shipping several hundred miles. We find that we can pick the berries and take them to these fairs in ordinary quart baskets and they will make a good appearance and keep good for several days. During the season of 1910, we showed 60 quarts of ripe fruit at the State Fair during the week of September 12th to 17th, inclusive. Some of these we carried in by hand and some were shipped in crates. We took up several plants with earth on them and set out in a large box to show the way these plants bear fruit and blossom in the fall. The box was filled up with wet moss and the plants kept fresh and green throughout the whole week with now and then an occasional watering.

During the last season, 1911, we showed berries and plants in pots at the State Fair. The plants were lifted from the field, just as they grew, with plenty of earth on the roots, and carefully set in six inch pots. The pots with plants in them were set side by side in a large box, being well protected by packing of moss between the pots, and shipped by express. Only four, out of twenty pots, were broken and the plants arrived in pretty good condition. In this way, we were able to show the plants just as they appear in the fields with all the blossoms, green and ripe fruit, on them. We also showed several quarts of fresh picked berries. The exhibit was novel and of some educational value.

During the last days of October the past fall, we sent about 35 packages of the fall bearing strawberries to as many editors and horticultural authorities, in different sections of the United States.

For the packages to hold them, we used strawberry baskets. Two of the baskets were nested together to make a stronger and more resisting package. The berries were completely enveloped in cotton wadding and packed tightly in layers in the inside basket until it was full. When full the basket was carefully wrapped in strong manilla paper, several thicknesses, and mailed at once. All of these packages arrived at their destination without smashing and only one lot of berries was spoiled; and this due to having to be re-shipped. The letters that we received were so interesting and characteristic of the men who sent them, that we are going to print some of them here for the benent of our readers. We think that in some cases we have shown these people that there is such a thing as a real fall strawberry as well as a splendid plan of sending a few samples of berries long distances by mail. Most of these berries were picked, packed and mailed October 26 and 27th.

Rochester N. Y., October 31st, 1911.

I thank you for sending me samples of your fall bearing strawberries which arrived in good condition.

The berries are very large and showy and it is indeed remarkable to have fine strawberries at this season.

Very truly yours,
W. C. BARRY.

Office of the Country Gentleman.
Philadelphia, Pa., Oct 17th, 1911.

We beg to acknowledge receipt of your specimens of fall strawberries, Francis and Americus. These we pronounce of unusually good quality for late bearing berries. Please tell us more about them.

Sincerely yours,
THE EDITORS.

Office of Northwestern Agriculturist.
Minneapolis, Minn., Oct. 30th, 1911.

We were delighted to receive the box of strawberries which arrived in fine condition.

We thought that greater publicity and pleasure could be given by enjoying them with the employes in our office, and so the strawberries were divided like the talents of the Bible,—some received a whole berry, some half a berry, and some a quarter of a berry. Who can tell from whom you will receive the greatest returns?

In the Horticultural Department you will find a little notice of the receipt of the box of berries.

If you have succeeded in getting a berry suitable to withstand the heat of summer, you certainly have accomplished wonders.

P. V. COLLINS, Editor.

Office of The Fruit Grower.
St. Joseph, Mo., Oct. 30th, 1911.

The strawberries you sent us with your letter of October 26th, arrived this morning in the finest kind of shape. We fixed these berries up nicely and got a good photograph which

we want to use in one of our early issues with a few notes about the berries.

We hope you will fix up another nice little story about these for our Small Fruits number next March.

Yours very truly,
E. H. FAVOR,
Associate Editor.

Office of Green's Fruit Grower.
Rochester, N. Y., Oct. 21st, 1911.

Thanks for the beautiful strawberries which were packed, as I never saw strawberries packed before. Each berry was wrapped completely in cotton and all safely stowed away in tiers in a quart berry basket. The strawberries came in perfect condition without a bruise on any one berry. This method should be adopted by others who are sending Green's Fruit Grower samples of fruit, which often come bruised or decayed owing to careless packing. Remember that fruit must not rattle or be loose in the package, for if it does wabble about in the package, you may be sure it will be bruised before it reaches our office. Remember this in your packing of fruit for shipment to market. If you cannot pack the fruit so it will not rattle in the package, you might as well throw the fruit away before it starts on its journey, for it will not arrive in good condition in the distant market.

These are fall bearing strawberries, of which we have heard much lately. These berries were of large size, fine color and of good fair quality. Mr. Farmer may be congratulated upon his success in growing fine strawberries. Years ago, I used to pick strawberries in October from the Capt. Jack and James Vick strawberries, but not enough to offer in market.

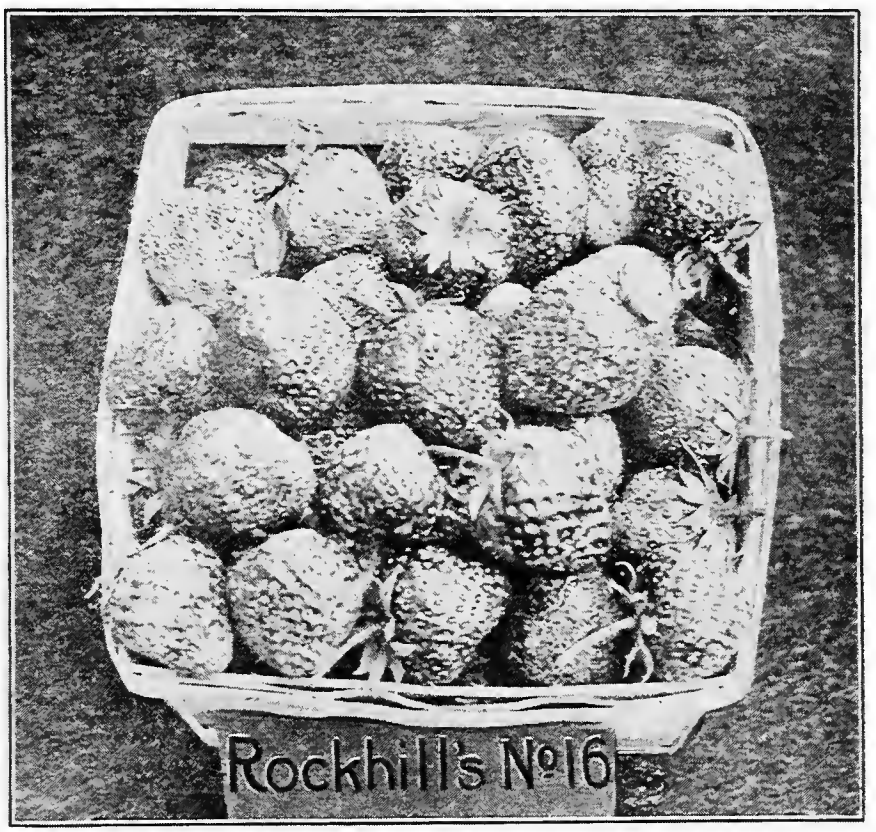
Yours very truly,
C. A. GREEN.

Office of Farm Journal.
Philadelphia, Pa., October 17, 1911.

The box of strawberries which you mailed to me a few days ago were received in surprisingly good order and were duly inspected and enjoyed. I showed the berries to Mr. Jenkins and Mr. Atkinson, and then took them home for my family to taste. They certainly were very nice, and I appreciate your courtesy in sending them to me.

How is the book coming on that I understand that you were getting up for Mr. Jenkins, to be published in pamphlet form by the Farm Journal Company? Have not heard anything about it lately.

Very truly yours,
WALTER E. ANDREWS,
Associate Editor.



Basket of Rockhill's No. 16, photographed Oct. 26, 1911.

Office of Ohio Farmer.
Cleveland, Ohio Oct. 21st, 1911.

We have received the package of fall grown strawberries which you sent and thank you very much for giving us a chance to see them. It is quite an unique sight and we were surprised at the excellence of the quality of these berries. If you have reached the point where you can have strawberries continuously throughout the late summer you certainly have accomplished a wonderfully valuable work. We have a note about these berries in next week's issue of the Ohio Farmer.

Yours very truly,
THE EDITORS.

Office of Rural Life.
Rochester, N. Y., Oct. 19th, 1911.

I am pleased to acknowledge receipt of sample of the Francis and Americus fall bearing strawberries. They are certainly fine. I have had them photographed, exact size, and the photos will appear in our December number, together with a descriptive article containing the facts you gave in your brief letter. I should like, however, a more extended account of your experiments with these berries and the results, with methods of culture. The photos are exceptionally fine and will reproduce nicely in half-tone.

Very truly yours,
ELMER E. REYNOLDS.

Office of Orange Judd Company.
New York, N. Y., Oct. 30th, 1911.

Your letter of the 26th inst. is extremely interesting to me. The box of strawberries were duly received. They came very solid and crisp and were delicious. This whole proposition of yours is of immense interest to me. I am going to say a word about it in one of my "Walks and Talks" articles before very long.

I thank you very kindly for your thoughtfulness and the very friendly way you have taken to call my attention to the wonderful work you are doing. I am

Very sincerely yours,
C. W. BURKETT,
Editor American Agriculturist.

Office of National Stockman and Farmer.
Pittsburgh, Pa., Oct. 1°th, 1°11.

Thank you for your favor of the 17th, which came yesterday. The strawberries came in today in elegant shape. They are certainly fine in every way and we appreciate the fact that you remembered us. We hope to reciprocate in a way that will be entirely satisfactory to you. This innovation in the strawberry business ought to be popular and we hope that you will reap the benefit of your patient work along this line.

We never saw finer or more uniform berries in the best summer season, and the flavor could not be improved upon. We thank you for every member of our staff, all of whom have sampled them and are ready to testify to their good points.

Yours very truly,
T. D. HARMAN.
Business Manager.

Office of Metropolitan and Rural Home.
New York, N. Y., Oct. 30th, 1°11.

We were quite delighted to get such an unexpected whiff of spring at our office today. The berries arrived in splendid state, and indeed were much appreciated. The smaller berry underneath had an especially delicious flavor. We are greatly indebted to you and shall speak of these berries in our Rural Home. Do not forget us in article for Horticultural issue. It would be well to emphasize in that article your success in raising these fall berries.

Very truly,
EDITOR RURAL HOME.

Office of Market Grower's Journal.
Louisville, Ky., Oct. 30th. 1911.

We have your favor of the 26th inst. and thank you for sending us the box of Fall Bearing Strawberries, which reached us this morning in good shape. There was only one bad berry in the lot and this had evidently been bruised in some manner. As you see, the box was in the mails fully four days, so that we were much surprised at the condition of the berries. They undoubtedly stand up well.

The berries were tested by a number of people and all expressed surprise at the pleasant aroma and the delightful flavor. It was unique in a certain sense for one would expect from berries out of season a flavor similar to that we get in the berries shipped early in the spring from the far south, which in fact is no flavor at all. We know nothing of the cost of producing these berries in the fall, but if that is not too great, we see no reason why growing them for a select trade should not be a commercial proposition.

We are going to write an article for the Market Grower's Journal in regard to these berries and publish same in an early issue. If you have any good photograph that would be suitable for publication with this article, we shall be under obligations to you for sending same to us as soon as possible. We are willing to do our part, and let progressive gardeners know that the production of Fall Strawberries is a commercial proposition.

Yours very truly,
SAM W. SEVERANCY.

Office of Up to Date Farming.
Indianapolis, Ind., Oct. 30th, 1911.

Have yours of the 26th, and also the box of sample strawberries received in good condition.

It was quite a surprise to us to receive such nice strawberries and when your letter came and I read it, and related the story about the bearing of this variety of strawberries its season and the productiveness, I was even more astonished. I will take the strawberries home this evening to the family and test their quality, but I am anticipating quite a royal treat.

Yours very truly,
J. A. EVERETT, Editor.

Office of the Southern Fruit Grower.
Chattanooga, Tenn., Oct. 31st, 1911.

We are in receipt of your letter of the 26th, also the sample box of Francis and Americus, fall bearing strawberries. We find them very delicious indeed. We have shown these to a great many people and all are interested in them.

Very truly,
ROBERT S. WALKER, Editor.

Office of The Southern Planter.
Richmond, Va., Oct. 31st, 1911.

We have your favor of the 26th, also a package of Fall Strawberries for which we thank you. We have sampled these berries and find them very nice indeed. We will call attention to these varieties in our December issue.

Yours very truly,
B. MORGAN SHEPHERD.

Office of the Florist's Exchange.
New York N. Y., Oct. 30th, 1911.

Unfortunately the strawberries did not reach us until Monday morning, but they came in in very good shape indeed, and we have had a photograph made of them. If same turns out well we will illustrate these two varieties in our publication, The Florists' Exchange.

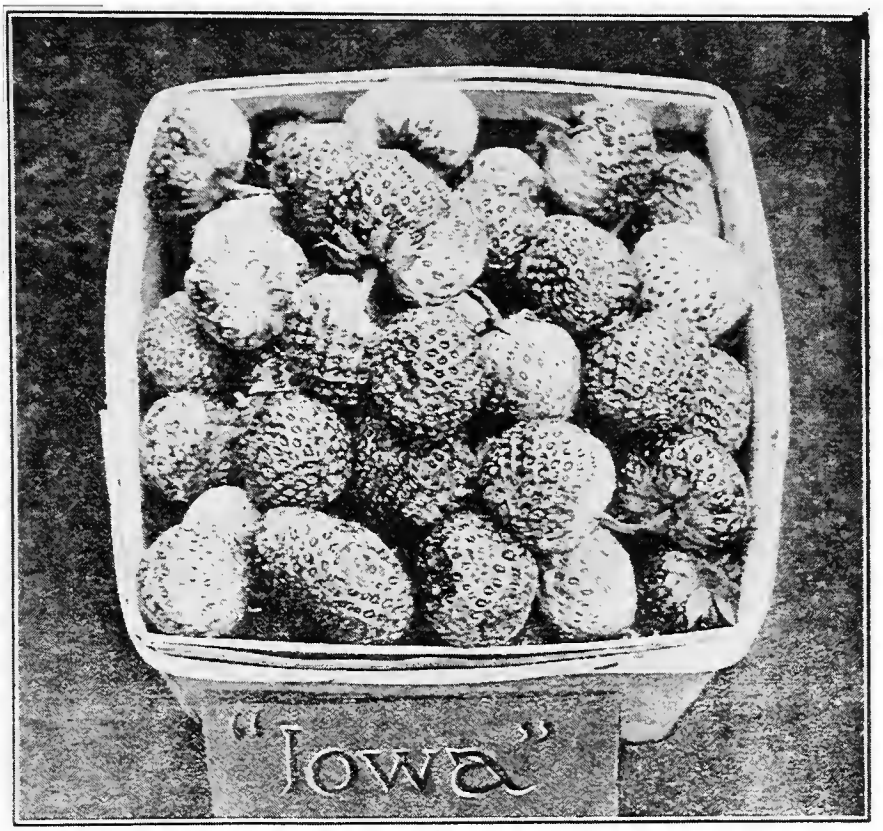
Thanking you for drawing these strawberries to our attention, believe us

Very truly yours,
A. T. DELAMARE.

Office of Country Life in America.
Garden City, N. Y., Oct. 30th, 1911.

I beg to acknowledge with thanks the basket of strawberries which you sent me and which arrived in good condition. It is certainly remarkable that such strawberries can be grown in the fall, and I am much interested in having the facts. How do you think these fall strawberries compare with the June berries in flavor?

Very truly yours,
WALTER E. DYER.



"Iowa" Fall Bearing Strawberry, photographed Oct. 26, 1911.

Office of American Fruits.
Rochester, N. Y., Oct. 18th, 1911.

Box of strawberries arrived this morning in excellent condition. They are remarkable. They bear out all you say of them. We are writing something about them for coming issues. You certainly have a novelty of real merit. We congratulate you.

Very truly yours,
RALPH T. OLCOTT.

Office of Farm and Home.
Springfield, Mass., Oct. 30th, 1911.

Yours of the 26th inst. duly received with basket of fall bearing strawberries, which came in excellent condition. I am very glad of the opportunity to test them and later shall have something to say about them in Farm and Home. I took pictures of them and if they are satisfactory will make a cut to print.

Very truly yours,
EDWIN C. POWELL, Editor.

Office of Household Journal and Floral Life.
Springfield, Ohio, Oct. 30th, 1911.

Your letter of Oct. 26th reached us today, also the liberal sample package of your fall bearing strawberries. These are fine specimens indeed of this most luscious fruit. Please accept our thanks. We will be glad to publish a notice regarding these berries in our next issue, which will be for the month of December.

Yours very truly,
W. A. MARTIN.

Office of Successful Farming.
Des Moines, Iowa, Oct. 30th, 1911,

I am just in receipt of a box of fall bearing strawberries from your place, and I thank you for the privilege of seeing them.

They came through in very good condition. The Francis are the nicest looking but are not as well preserved as the Americus at the end of the journey.

I am glad to see that a few patient experimenters are beginning to get results from this class of berry.

Yours very truly,
ALSON SECOR, Editor.

Office of The Family Magazine Section.
New York, N. Y., Oct. 17th, 1911.

The box of strawberries which you kindly sent to Mr. Paine our editor, fell into the hands of his staff, as he is away in the backwoods of Canada on a hunting trip. Please accept my thanks for the treat that you gave us; the strawberries were delicious, and, to most of us, eating this fruit in October was a unique experience.

W. A. ROBERTS, Assitant Editor.

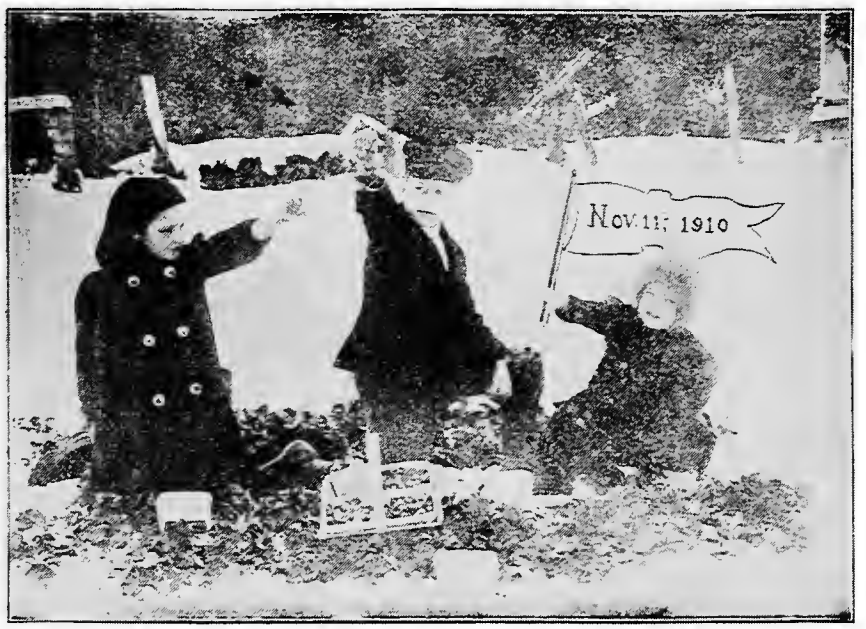
Some of them came in good condition and we succeeded in getting paintings of three varieties, but the Iowa and Americus were so badly decayed when they reached us that it was impossible to do anything with them.

If you can furnish us additional specimens in the boxes transmitted herewith, we will take it as a special favor, and Col. Brackett will give them personal examination as he is expected in the office today.

Yours very truly,
M. HUDDLESON, Assistant.

Office of Farm and Fireside.
Springfield, Ohio, Nov. 3rd, 1911.

Your letter under date of Oct. 26th, was read with interest. The samples of fall bearing



After the Last Strawberries. Photographed Nov. 11, 1910.

Editorial Office of National Nurseryman.
Ithaca, N. Y., Oct. 31st, 1911.

Your letter of Oct. 26th, accompanied by specimens of your ever-bearing strawberry is received. I have been interested in ever-bearing strawberries for some time, and we have secured quite a collection of these, and are making a study of their relationships. It is indeed unique to find full grown, agreeable flavored berries grown out of doors at this time of the year. They seem to be exceptionally fine textured, and possess excellent keeping qualities, although the amount of sugar is apparently not as high as in summer-grown berries.

Yours sincerely,
JOHN CRAIG.

Office of The Fruit Belt.
Grand Rapids, Mich., Nov. 3rd 1911.

We beg to acknowledge receipt of your sample of fall bearing strawberry, which reached us in good condition. We will be pleased to make some mention of this in a near issue of The Fruit Belt.

Yours very truly,
GEO. W. WELSH.

United States Department of Agriculture.
Washington, D. C., Nov. 4th, 1911.

Your specimen strawberries were received during the temporary absence of Col. Brackett. strawberries came to hand Monday evening, Oct. 30th, and most of the berries were in very good condition. We were gratified to find how well you have succeeded in producing a fall producing strawberry that would develop the berries so late in the season.

The quality of the berries in flavor and evenness of ripening was also something of a surprise to me.

I am particularly interested in your experimental work in small fruits from the fact that my brother-in-law Mr. William C. Gorman, now deceased, was at one time a teacher in the schools of your city, and I have frequently heard him speak of your interest and success in improving small fruits.

Thanking you for making us acquainted with your work in this direction, I am

Sincerely yours,
B. F. THORPE, Editor.

Office of Park's Floral Magazine.
LaPark, Pa., Nov. 8th,1911.

I received the strawberries in good condition and we found them as delicious as they were handsome. You ought to have a liberal trade in the plants that will produce such berries during the autumn months.

Very truly yours,
GEO. W. PARK, Editor.

Practical Suggestions on Marketing Berries

Thirty years of experience in a business will teach some things that cannot be learned in a day It takes energy and skill to grow a good crop of berries but it requires more tact and judgement to get proper returns from the sale of them than it does to grow them. I have repeatedly seen farmers waste the efforts of a year by foolish methods of marketing. I think this is really the most important end of the business. I am sorry to say that there are more men who understand how to grow a good crop than there are who understand how to properly market it.

In the first place, the crop must be good and put up in good shape. I do admire a man who puts up his goods in good shape and has them look neat and tidy. They are practically sold if you do this. It reminds me of my father's experience with pigs. Father used to keep lots of hogs and raised pigs to sell. He always had them in a clean dry place and every body wanted them. All he had to do was to raise the pigs and they were sure to be sold with no particular advertising on his part.

One must not only do the right thing himself, but he must see to it that the other fellow does the proper thing. It is not right to let your neighbors take advantage of your thrift, if they are careless and slovenly. Suppose your berries are shipped with your neighbor's in one car to a certain commission merchant. You put up your berries in the best shape, and, having been well grown, are naturally better berries any way. Suppose your berries are worth four or five cents a quart more than your neighbor's. Do you suppose you always get your just deserts? If you do, I don't. I believe in a good many cases the sales are averaged up, and while you may get a cent or more per quart to "encourage" you, I don't believe you get what you should. Now what is the remedy? The best remedy is to sell your berries on the market at home and let the other fellow take the chances of shipping. You thus escape the discouragement of delays, arriving late, glutted markets, dishonest consignees etc. Another way is to select the best commission merchant you can find and send your berries to him from day to day, and if he uses you right, from year to year. If your fruit is right, buyers will call for it and there will always be a demand for it, no matter whether gluts occur or not. It might be well to call around once in a while and see what your berries are selling for. It might pay you to purchase a crate yourself. once in a while. You have city friends who could use them.

The great trouble with most farmers in growing berries is that when they get a crop they think it ought to be sold without any effort on their part. They possibly have been growing grain or hay or fattening calves, and the buyers have come to their doors and told them what they would give for their crops. With berries, in order to get the most out of them, you must sometimes have to get out and rustle yourselves. It is all very nice to grow berries or anything when there is a brisk demand for it. When the crop is scarce, everybody wants it and you don't have to put forth any effort to sell it. People will flock to you, begging to get your berries. All you have to do is to see that you get a good crop and put them up in proper shape. There comes a time however when it seems that everybody else has berries and no one wants yours. The average person who has this experience for the first time will sit right down and let things go to the dogs. The conditions may be just like poverty and riches. You always find the most miserable poverty close by the richest people. There may be people in your own town who actually want your berries if only you would drop a little on the price. It is wonderful how many people who can use berries at 6 to 8 cents per quart who have no use for them at 10 to 12 cents per quart. Any price is better than nothing. In your available shipping territory, there may be many towns that could more than use all your fruit at a fair price if the dealers only knew it. I take great chances when I cannot do better. If fruit is high on account of scarcity, I keep a stiff upper lip. If it is plenty and cheap, I am easy and liberal.

One way that I have disposed of a great qnantity of fruit is to have a list of grocerymen and others in small towns within 200 miles of our town that I have been used to shipping fruit to from year to year. It don't take long to find out who are the honest ones, and these I place great confidence in. I have even gone so far, in some years when berries were a drug and real cheap, as to ship a whole season's crop of berries to them without exactly knowing what I was to get, making settlement at the close of the season. I wish to say that my list of dealers was recommended by concerns that have been doing business with them for years.

When I know what berries are bringing in a certain town, if I can stand those prices, I bill them out to the dealer at a price sufficient for him to pay expressage and make his commission. Most of these dealers have customers who wish to can berries and I try to keep them informed as to the days when I will have more berries than usual and at the lowest price. When the whole country seems to be full of berries, I divide them as much as

possible and send them out without any bills, just leaving it with the dealer to do the best he can. My reason for not sending bills at such times is, that in towns where there is a great surplus, the dealer may refuse the shipment if they are billed too high, while in other towns, there may be only a normal supply and I might bill too low. By practicing this plan, I have been able to get on an average, 2 cents per quart better than our neighbors who sell to canning factories or to local buyers. I should say that in taking the chances enumerated above, we do it only with merchants in local cities within a radius of 150 to 200 miles of Pulaski. We expect and receive prompt settlement and daily account of sales from the large city commission men.

The local market in your own town should always be worked to the utmost. I believe in making sales through the local grocerymen and dealers as far as possible. I rather give them a fair profit than to bother with trying to reach the consumer direct by peddling or solicitation. You have heard the statement made many times that the farmer never sets the price on his produce. He raises the stuff and the other fellow puts the price on it. Here is one FARMER who sets the price on his berries when they are sold in Pulaski. If I leave a lot of berries at a store, I tell the dealer what price to put on them. I ought to know and do know better than any other person in this town what berries ought to bring and what they really will bring. I tell the dealer to sell for 10, 12 or 14 cents per quart whatever I think the market will stand, and he has to sell for these prices. I give the dealer 1½ cents per quart for handling and buy my goods of the groceryman who sells my berries. If things go bad in the market, the telephone is at hand and we use it. I always agree to take back any berries that go bad and cannot be sold. Raising the most berries of any party in town and practicing these methods, I have done more to cause berries to be sold in Pulaski at a just price than all other forces combined. When prices drop too low to suit me, all my berries go out of town. The dealer cannot control the situation where there are a lot of fool growers. One foolish farmer going about town selling berries way below what the stories are asking, will do more to hurt the market than all my boosting helps it; and we sometimes have to submit to the inevitable, and ship our berries out of town. Some of the dealers have old fogy ideas that they know better about what prices should be than I do, and it is rare that they get any of my fruit.

Some years in marketing berries, especially raspberries, currents and gooseberries, we take a couple or three days from our usual occupations and go through the town and contract as much fruit as possible for canning, delivering the same as it ripens. In this way, I have made a market for several thousand quarts of berries in less than three days. It is an awful good idea, you know where a large part of your fruit is going, and you can place the balance of your crop to better advantage.

It has been many years since I have made a business of peddling from house to house. I don't like the idea, and if it must be done, I leave it to younger men. Peddling is demoralizing to business anyway and I think that those who take advantage of this method of disposing of their fruit should show more judgement, for their own good, as well as the trade in general.

Farmers, more and more are specializing. The dairy farmer spends his time with the dairy and don't like to bother with strawberries. It is the same with farmers who grow grain and other crops, they leave berry growing to the professional berry grower. For this reason, we find that the farmers are among our best customers. They buy in large quantities and we can give them the benefit of lowest prices.

Sometimes it will rain for a day or two and after the rain has stopped, there will be a great big picking of rather soft fruit. Now we must get busy We try to get the fruit off the vines as soon as possible and into the hands of consumers. This is the time when we send the boys peddling about town with wagons and call up the farmers on the telephone. If these berries were placed in the stores and allowed to stand about for a day or so, most of them would mold and rot. It is "do the best you can" in such cases.

I have always had an idea about marketing that I have never seen or heard of being put into practice. Most everybody knows what advertising will do for anything. Suppose a large community, extending over a whole county or several counties, is engaged in strawberry culture. These berries will ripen about the same time and can be pooled and handled by one shipping concern, this concern to be owned and controlled by the growers. When these berries are put into any large city market, they could be advertised, same as Gold Medal Flour or Welch's Grape Juice. This would stimulate an awful demand and dealers in all the large cities would be anxious to get the berries from that section. Of course many details would have to be worked out. Growers would have to combine their interests and submit to rules and regulations. Fewer varieties would have to be grown and most everybody grow the same variety or something very similar. In all such undertakings that are successful, some few men must do a lot of thinking and work for nothing, and I am sorry to say that this is not always fully appreciated by those who receive the benefits.

L. J. FARMER.

Strawberries For Christmas

To thoroughly enjoy strawberries, one must grow them himself. If you live right close by a person who grows them for market, you may be able to get fairly fresh strawberries in good condition every day, but this is a privilage that very few enjoy. Most of the supply of strawberries is grown miles from the place they are marketed in, and necessarily must be picked before they are thoroughly ripe, same as all fruits are picked comparatively green when sent to distant markets. The strawberry does not reach its highest perfection in size, color and flavor unless allowed to thoroughly ripen on the plants.

Strawberries may be grown in any climate and on most all kinds of soils, if comparatively well drained and sufficiently fertilized. The ideal soil for them, however, is a soil naturally adapted to corn or potatoes. There are a few varieties that do well on low, wet soils, but the most of them reach their highest perfection on uplands, naturally strong and retentive of moisture.

Strawberry plants may be set out or transplanted at most any time of the year when the ground is in workable condition, but they do best when set in the cool of the early spring or in autumn. In most localities, spring is the safest time to plant; but in the South, it is preferable to plant in late autumn.

For best results, the land should be cleared of all large stones, stumps or other material that will interfere with the thorough cultivation of the soil. It is not sufficient that rubbish be plowed under; it must be removed as the cultivator is sure to drag everything to the surface. It is best to select a plot of ground that has been in cultivation for two or three years; to avoid being troubled with the white grub, which often destroys whole plantations of strawberries when set on pasture or meadow land. The land must be plowed when in good condition, not too wet, and thoroughly harrowed, up to the day the plants are to be set out.

It should be marked into straight rows about four feet apart. The plants should be set by hand about a foot apart in the row. When setting the plants, they should have the roots kept moist by placing in a pan with water in the bottom and one plant taken out at a time and properly set before it becomes dry and shrivelled

After the plants are set, the earth about them should be stirred with hoe or garden rake, very shallow, and horse cultivation begun at once. Hoeings should be made as often as necessary to keep the soil loose about the plants and the weeds from growing Horse cultivation should be kept up every week from the time the plants are set out, up to freezing weather in the fall. It is necessary to hoe about six times to get fairly good results.

When the blossoms appear in May, they should be cut off. This will be the only time that June-bearing varieties will need to have the blossoms removed, but fall-bearing kinds will send out another set of blossoms in about a month, and these must be removed. From this time on the supply of blossoms on the fall-bearing kinds will increase, and they must be removed every week or ten days, up to within three weeks of the time we want fruit. The usual time to stop cutting the blossoms on fall-bearing kinds is about August 1. June-bearing strawberries bear their crop in the early summer of the year following the year they were set out. Fall-bearing varieties bear their crop the same year they are set out.

On the approach of freezing weather, about December 1st in the North it is best to cover the surface of the strawberry bed with some material that will prevent the bad effects of alternate freezing and thawing of the soil in winter and early spring. The best materials for this purpose are coarse marsh hay, clean straw, strawy manure, and the like. This should be put on just heavy enough to cover the plants and the surface of the ground, and all should be removed in the early spring, just before growth starts.

Strawberry plants are great feeders and must be sufficiently fertilized in order to get large crops. They must have plenty of moisture, too. The rainfall is not always to be depended upon, so it is wise to try and hold as much moisture in the soil as possible,by heavy mulching with straw or other coarse material placed between the rows up among and about the plants. This should be done after a rain, some little time before the fruit begins to ripen. All thistles and perennial weeds should be removed before picking is begun. The thistles and large weeds interfere with picking and sap the goodness and moisture from the strawberry plants.

The best fertilizers to use are animal manures used on the crops that precede the strawbarries; and commercial fertilizers after the plants are set out It always pays best to use a high-grade featilizer, analyzing not less than 4 per cent. nitrogen, 10 per cent. each of potash and phosphuric acid. This should be put on in handfuls between the plants, at intervals of about a month apart throughout the growing season. It may be hoed into the soil or it may be put on just after a good hoeing.

Strawberries continue in fruiting a long time and yield phenomenal crops. It is getting quite common to hear of yields of 10,000

quarts to the acre. At ten cents or more per quart, one can see that they are exceedingly profitable. If a larger price can be secured all the better; there is good money in them under certain conditions with a smaller price. During the past few years there has come into existence a new type of strawberry, known as ever-bearing or fall strawberries. These strawberries are the marvel of the fault-growing public at the present time. Nothing in the whole horticultural line is now so interesting. It is so strange, that many people will not believe there is such a thing as a real fall strawberry. Ordinary strawberries sometimes bear a crop of fruit in the fall following a crop in the spring, and so people think that these fall strawberries are only a freak second crop. When it is understood that they bear the first year that they are set out, and bear a crop as large or larger than ordinary June-bearing kinds, people will stop doubting and will sit up and take notice.

I am not the originator of this new race of strawberries, but I have shown what their possibilities are, probably better than any other person. With 500 plants set about May 1, we were able to secure during the months of August, September and October, nearly 400 quarts of nice, rich-colored, high flavored strawberries, which were sold at wholesale at twenty-five cents per quart. This figures out something like 8,000 quarts, and over $2,000 to the acre. These berries have done equally well during the three years that I have tested them, showing that the quality of bearing in the fall is a fixed characteristic.

During the past season we began picking strawberries June 1. The spring-bearing kinds lasted well into July, when the fall-bearing kinds began to ripen, and there has not been a day since June 1 up to the present time, October 30, when we could not have had fresh strawberries on the table. On October 26 we picked eighty-four quarts. The vines are still well-laden with green berries, although the ground was slightly frozen last week. Should sunshiny weather continue we would pick strawberries well into November. Further South, in the Carolinas and Georgia, I see no reason why they won't be able, when they get into these new varieties of fall strawberries, to gather fresh strawberries from the open ground for the Christmas dinner.—L. J. FARMER, in Rural Home.

THE MAN WITH THE HOE

This is the poet Markham's famous "Man With The Hoe" "Bowed by the weight of ages, he leans upon his hoe and gazes on the ground, the emptiness of ages in his face, and on his brow, the burdens of the world."

This is not the type of man who succeeds in growing profitable crops of strawberries if he may happen to be in the business himself and if he is a hired hand, which case is liable to be most common with such a type of man, we advise our friends to let the other fellow hire him. To use the words of E. P. Roe.—"Successful work on a fruit farm, or in a garden, requires a quick brain, a keen eye, a brisk step and a deft hand. Many of its labors are light, and no profit can follow unless they are performed with dispatch, at the right time and in the right way."

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L. J. FARMER, Pulaski, Oswego Co., N. Y.

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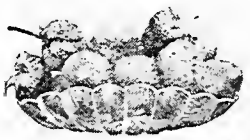

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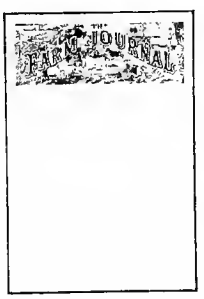

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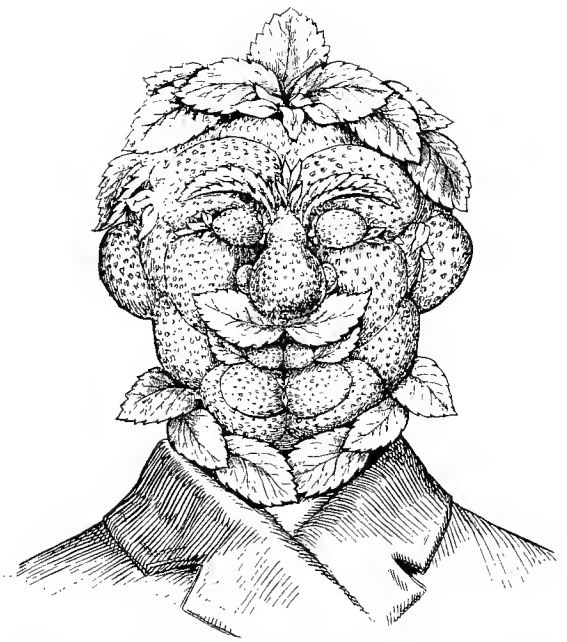

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